

# Annotated type catalogue of the Chrysididae (Insecta, Hymenoptera) deposited in the collection of Maximilian Spinola (1780–1857), Turin

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## Abstract

A critical and annotated catalogue of the ninety-six type specimens of Chrysididae (Hymenoptera), belonging to sixty-seven species, housed in the insect collection of Maximilian Spinola is given. The neotypes of six species are designated: *Chrysis bicolor* Lepeletier, 1806; *C. comparata* Lepeletier, 1806; *C. dives* Dahlbom, 1854; *C. pumila* Klug, 1845; *C. succincta* Linnaeus, 1767; *Hedychrum bidentulum* Lepeletier, 1806. The lectotypes of twenty-four species are designated: *Chrysis aequinoctialis* Dahlbom, 1854; *C. analis* Spinola, 1808; *C. assimilis* Dahlbom, 1854; *C. bihamata* Spinola, 1838; *C. chilensis* Spinola, 1851; *C. dichroa* Dahlbom, 1854; *C. distinguenda* Dahlbom, 1854; *C. episcopalis* Spinola, 1838; *C. grohmanni* Dahlbom, 1854; *C. incrassata* Spinola, 1838; *C. pallidicornis* Spinola, 1838; *C. pulchella* Spinola, 1808; *C. ramburi* Dahlbom, 1854; *C. refulgens* Spinola, 1806; *C. splendens* Dahlbom, 1854; *C. succinctula* Dahlbom, 1854; *C. versicolor* Spinola, 1808; *Elampus gayi* Spinola, 1851; *Hedychrum caerulescens* Lepeletier, 1806; *He. chloroideum* Dahlbom, 1854; *He. difficile* Spinola, 1851; *He. virens* Dahlbom, 1854; *Holopyga janthina* Dahlbom, 1854; *Ho. luzulina* Dahlbom, 1854. Previous lectotype designations of five species are set aside: *Chrysis bicolor* Lepeletier, 1806 (designated by Morgan 1984); *C. calimorpha* Mocsáry, 1882 (designated by Móczár 1965); *C. elegans* Lepeletier, 1806 (designated by Bohart (in Kimsey and Bohart 1991)); *Hedychrum chloroideum* Dahlbom, 1854 (designated by Kimsey 1986); *He. rutilans* Dahlbom, 1854 (designated by Morgan 1984). Three new synonymies are proposed: *Hedychrum intermedium* Dahlbom, 1845, **syn. n.** of *Holopyga fervida* (Fabricius, 1781); *Chrysis sicula* Dahlbom, 1854, **syn. n.** of *C. elegans* Lepeletier, 1806; *Chrysis succinctula* Dahlbom, 1854, **syn. n.** of *C. germari* Wesmael, 1839. *Chrysis distinguenda* Spinola, 1838, and *C. coronata* Spinola, 1808, are considered **nomina dubia**. *Hedychrum alterum* Lepeletier, 1806, and *He. aulicum* Spinola, 1843, are considered **nomina oblita**. *Hedychrum rutilans* Dahlbom, 1854, and



*He. niemelai* Linsenmaier, 1959, are retained as **nomina protecta**. The first available name for *Chrysis succinctula sensu* Linsenmaier is *C. tristicula* Linsenmaier, 1959, (**stat. n.**) The current status and validity of some types in the Spinola collection are discussed. Photographs of fifty-three types are given.

## Keywords

Chrysididae, neotype, lectotype, new synonymy, *nomen dubium*, *nomen oblitum*, *nomen protectum*, Spinola collection

## Table of contents

Introduction.....	2
Material and methods.....	5
Results and discussion .....	6
Types housed in the Spinola collection.....	6
Types not housed in the Spinola collection.....	66
Notes on other specimens in the Spinola collection.....	70
Conclusions .....	87
Aknowledgements .....	88
References .....	88

## Introduction

Maximilian Spinola was a very active entomologist and described hundreds of species in different families of Coleoptera, Hymenoptera, and Hemiptera (Gestro 1915). Spinola was also a famous collector, whose collection grew particularly with insects received from his properties in Spain and South America and in exchange with European entomologists. Additionally, he made expensive purchases of beetles and wasps from all over the world (Passerin d'Entrèves 1980) and of partial or entire collections by other famous entomologists of his times, such as Lepelletier de Saint Fargeau (later simply written: Lepeletier) (e.g. Spinola letter 00576) and Serville (e.g. Spinola letter 01566). The history of this collection was fully reconstructed only in the 1980s thanks to the analysis of his impressive bulk of correspondence (Casolari and Casolari Moreno 1980, Passerin d'Entrèves 1980). Maximilian Spinola was born in France, at Pézenas, Hérault, on July 10, 1780 and died in Italy, at Tassarolo, Piedmont, on November 12, 1857.

The hymenopteran collection of Maximilian Spinola is currently housed in the Museo Regionale di Scienze Naturali (MRSN) in Turin. However, it belongs to the Museo di Zoologia Sistemática dell'Università di Torino. The collection was organized following an old standard method: every species includes one to several specimens whose collecting data were removed from the insects and written on a main label at the bottom of the specimen-series. Every main label had a different colour depending on the provenances of the species: white (Europe), yellow (Asia), blue (Africa), green (Americas), rose (Australia). Every main label bears the generic and specific name, author of the species, the collectors, and the localities. Main



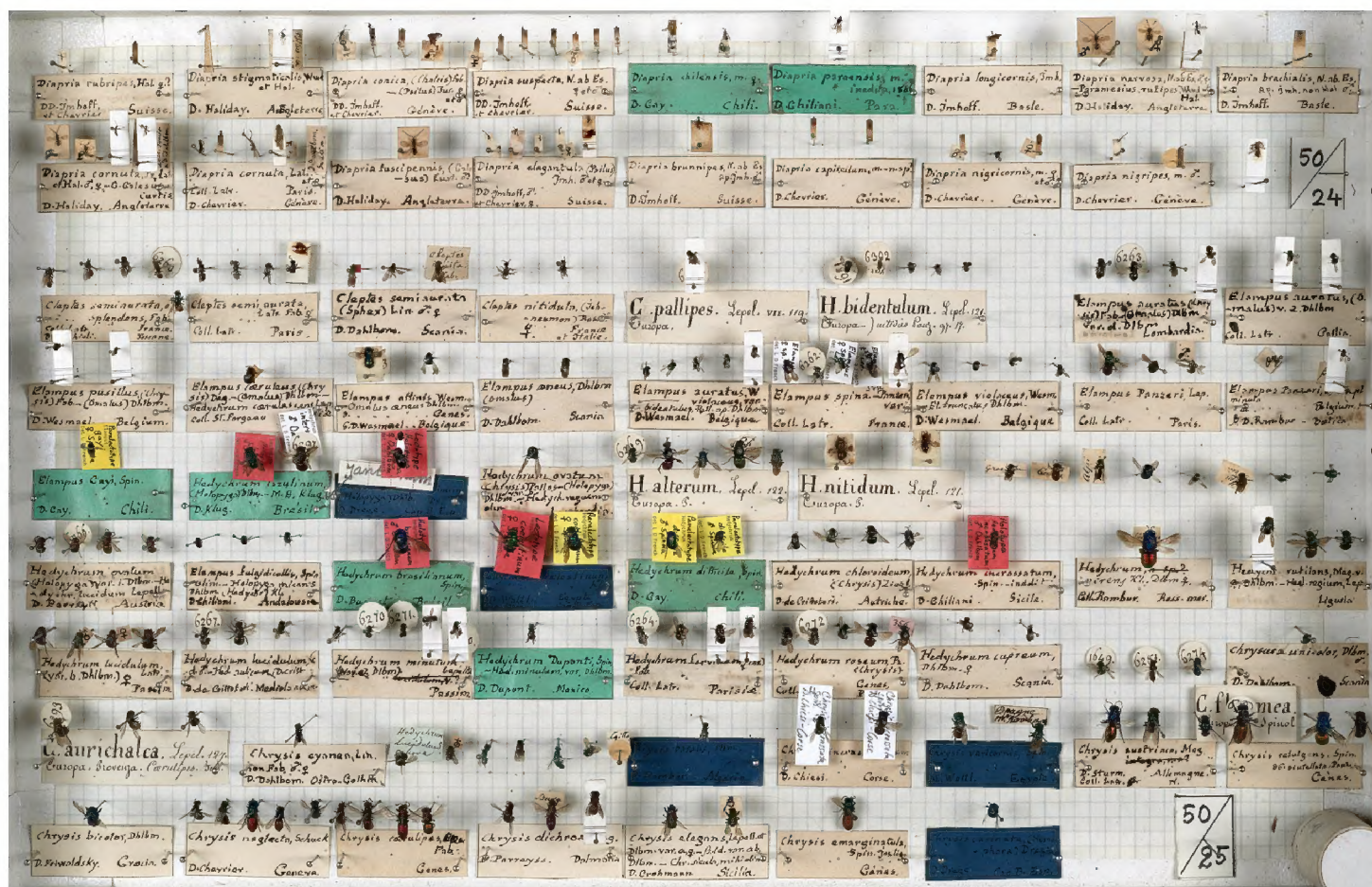


Figure 1. Spinola's Hymenoptera collection, box 50 (photo courtesy of MRSN).

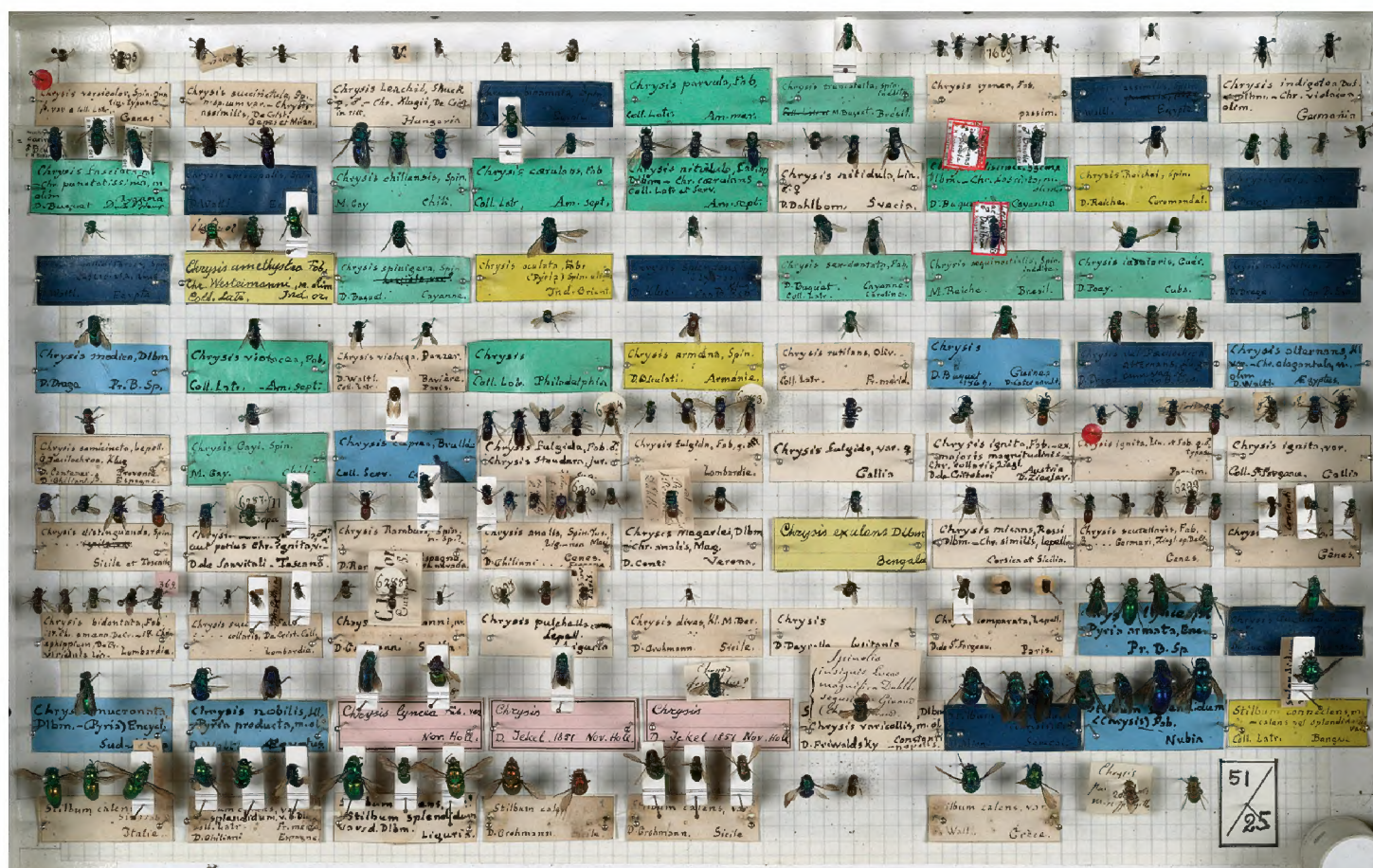


Figure 2. Spinola's Hymenoptera collection, box 51 (photo courtesy of MRSN).

references on Chrysididae related to this collection are: Spinola (1805, 1806–1808, 1838, 1840, 1851), Lepeletier (1806), Lepeletier and Serville (1825), Brullé (1846), Dahlbom (1854), and Kimsey and Bohart (1991). Many books and papers have been written on types of this collection, except on those referring to the hymenop-





**Figure 3.** Spinola's Hymenoptera collection, box 52 (photo courtesy of MRSN).

teran family Chrysididae (e.g. Bradley 1957; Vidano and Arzone 1978; Casolari and Casolari 1980; Passerin d'Entrèves 1980, 1983; Casale 1982; Giachino 1982; Olmi 1983; Baker 1999; Generani and Scaramozzino 2000).

The collection of Chrysididae by Spinola includes 399 specimens housed in three boxes numbered 50, 51, and 52 (Figs 1–3). The collection consists of specimens collected by some of the most important entomologists of their time as well as insect traders: Dahlbom, Draege, Fischer, Gay, Ghiliani, Klug, Latreille, Lepeletier, Megerle, Rambur, Serville, Walth, Wesmael, and Westermann (Passerin d'Entrèves 1980, pers. comm.). The collection is still roughly in the same order as it was left by Spinola, but it is not in good condition. Some type specimens have been destroyed by dermestids, and only pins and labels are left in the respective boxes. The first dermestid attack dated back to the first years after the death of Spinola (in 1857) and before Abeille de Perrin (1879), who already commented on the bad status of the collection, was able to study Spinola's collection. Also mechanical, accidental crushes and a layer of mould damaged the type material. The original Hymenoptera collection consisted of 69 boxes, later moved into new boxes preserving original labels and order left by Spinola (Casolari and Casolari Moreno (1980)).

The collection of Chrysididae by Spinola is very important, and it was fully studied and published by Spinola (1805, 1806–1808, 1838, 1840, 1851) and Dahlbom (1854). Spinola described many new species and even some new genera of Chrysididae (i.e., *Elampus* and *Stilbum*) that are still considered valid. Dahlbom, the first reviser of the family Chrysididae, described many new species based on Spinola's chrysidid collection. However, only a few types from the Spinola collection are housed in Dahlbom's collection in Lund (LZM); most of them are in Turin. The study of the type



material preserved in this collection was fundamental to clarify some doubtful and incorrect identifications of the species in the current sense.

In the present paper, we identified ninety-six types, belonging to sixty-seven species (six neotypes, thirty-two holotypes, twenty-four lectotypes, twenty-seven paralectotypes, and thirteen syntypes) deposited in the Spinola collection. Three neotypes are designated in NMLS (*Chrysis bicolor* Lepeletier, 1806, *C. succincta* Linnaeus, 1767 and *Hedychrum bidentulum* Lepeletier, 1806), and one neotype is designated in HNHM (*Chrysis calimorpha* Mocsáry, 1882) to ensure stability in the nomenclature of the Palearctic Chrysididae.

## Material and methods

Terminology and classification of genera and species groups follow Kimsey and Bohart (1991), classification of the European species follows Linsenmaier (1959, 1968, 1987, 1997a, 1997b, 1999), Rosa (2006), and Rosa and Soon (2012). Abbreviations used in the text are as follows: F-I, F-II, F-III, etc. = flagellum I, flagellum II, flagellum III and so on; S-II = second metasomal sternum; S-III = third metasomal sternum. We report the codes of the catalogue Casolari and Casolari Moreno (1980), according to the same system already used for Spinola's catalogues (Pagliano 2005).

Since there are no published photographs of the types in Spinola's collection and because some type species in this collection had been misinterpreted in the past, the present catalogue is illustrated with images taken from some types in the collection to facilitate future identifications.

Photographs of the types were taken with Nikon D-80 connected to the stereomicroscope Togonal SCZ and stacked with the software Combine ZP; the white calibration of the photocamera was applied to reduce the blue effect of the neon light of the Togonal microscope.

The definitions of holotype, neotype, lectotype etc. are used according to the International Code for Zoological Nomenclature (ICZN), fourth edition, later called "the Code". Types and other specimens have been examined from the following institutions:

<b>HNHM</b>	Hungarian Natural History Museum, Budapest, Hungary.
<b>IRSN</b>	Institut Royal des Sciences Naturelles, Bruxelles, Belgium.
<b>ISEA–PAS</b>	Invertebrate collections of the Institute of Systematics and Evolution of Animals, Polish Academy of Sciences in Krakow, Poland.
<b>LMU</b>	Linnémuseet, Uppsala, Sweden.
<b>LSL</b>	Linnean Society of London, England.
<b>LZM</b>	Lund Zoological Museum, University of Lund, Sweden.
<b>MCZ</b>	Museo Civico di Zoologia, Roma, Italy.
<b>MHNG</b>	Muséum d'Histoire Naturelle, Genève, Switzerland.
<b>MNHN</b>	Muséum National d'Histoire Naturelle, Paris, France.
<b>MNHU</b>	Museum für Naturkunde der Humboldt-Universität, Berlin, Germany.
<b>MRSN</b>	Museo Regionale di Scienze Naturali, Turin, Italy.



<b>MSNG</b>	Museo Civico di Storia Naturale "G. Doria", Genoa, Italy.
<b>NHML</b>	Natural History Museum, London.
<b>NHMW</b>	Naturhistorisches Museum Wien, Vienna, Austria.
<b>NHRS</b>	Swedish Museum of Natural History, Stockholm, Sweden.
<b>NMLS</b>	Natur Museum Luzern, Switzerland.
<b>ZMUC</b>	Zoological Museum, University of Copenhagen, Denmark.

## Results and discussion

### Types housed in the Spinola collection

The types of the following sixty-seven species listed are housed in the Spinola collection.

#### *Chrysis aequinoctialis* Dahlbom, 1854

Plate 1

*Chrysis aequinoctialis*: Dahlbom 1854: 330.

**Type locality.** "Habitat in Brasilia, Dom. Reiche; Mus. Dom. Spinola".

**Material. Lectotype** (here designated) ♂: *Chrysis aequinoctialis* Spin. inédite D. Reiche, Bresil.

**Catalogue Casolari & Casolari Moreno.** *Chrysis aequinottialis* (sic!), 1, 34, 75, 1 (box 51).

**Remarks.** Dahlbom (1854) described *C. aequinoctialis* based on at least a series of specimens. In the Spinola collection, only a male of this species is currently housed. Bohart pinned a lectotype label under this specimen, but the lectotype designation has not been published. Kimsey and Bohart (1991: 425) placed *C. aequinoctialis* in synonymy with *C. intricata* Brullé, 1846 and reported "Syntype male, female; Brazil (Turin)". However, the female syntype is not preserved in the collection. Since the female is possibly lost and the above male of *C. aequinoctialis* corresponds to Dahlbom's species description, we here designate the male specimen as lectotype of *C. aequinoctialis*. We deem Spinola's collection as the right place for this lectotype designation, since the collection is cited in the original description and the choice of the male is to be preferred since the genitalia dissection can help in a future study of *C. aequinoctialis*.

*C. aequinoctialis* is currently considered as synonym of *C. intricata* Brullé, 1846 (Kimsey and Bohart 1991). Yet the interocellar distance measured between lateral ocelli (IOD), the length of the malar space and the transversal frontal carina (TFC) are distinctly different between the lectotype of *C. aequinoctialis* and those specimens described by Bohart and Kimsey (1982: 135). It belongs to the *smaragdula* group and a worldwide revision this group is needed.

**Current status.** *Chrysis intricata* Brullé, 1846 (synonymised by Kimsey and Bohart 1991: 425).



***Chrysis alternans* Dahlbom, 1854**

*Chrysis alternans*: Dahlbom 1854: 236.

**Type locality.** "Habitat in Aegypto et in Promontorio bonae spei, Museis DD. Drewsen, Spinola et Westermann".

**Material. Paralectotype** 1 ♂. *Chrysis* vel *Poecilochroa alternans* Klug. cum var.  $\beta$  D. Draege Cap. B. Esp.

**Paralectotypes** 2 ♀♀. Idem.

**Catalogue Casolari & Casolari Moreno.** *Chrysis alternans*, 13, 53, 21, 3 (box 51).

**Paralectotype** 1 ♂. *Poecilochroa alternans*, Klug.

**Catalogue Casolari & Casolari Moreno.** *Poecilochroa bifasciata*, 132, 53, 0, 1 (box 52).

**Remarks.** Dahlbom (1854) described three variations (*a*, *b*, *c*) of *C. alternans*. Bohart (in Kimsey and Bohart 1991: 381) designated a lectotype of *C. alternans* at ZMUC. Dahlbom's three variations of *C. alternans* are nowadays considered distinct species, referring to two different species groups. In Spinola's box 51, there are three specimens placed under the label *C. alternans* (Casolari and Casolari Moreno 1980: 79). Two of them belong to var. *a*, whereas the third refers to var. *b* and belongs to a different species with a similar colouration. A further specimen of "*C. alternans*" was found in box 52, under the name *Poecilochroa alternans* and should be considered as another paralectotype referring to var. *b*. The examination of the lectotype in ZMUC revealed that it belongs to var. *a* (Madl and Rosa 2012: 16). It belongs to the *alternans* group.

**Current status.** *Chrysis alternans* Dahlbom, 1854.

***Chrysis analis* Spinola, 1808**

Plate 2

*Chrysis analis*: Spinola 1808: 26.

**Type locality.** "Liguria".

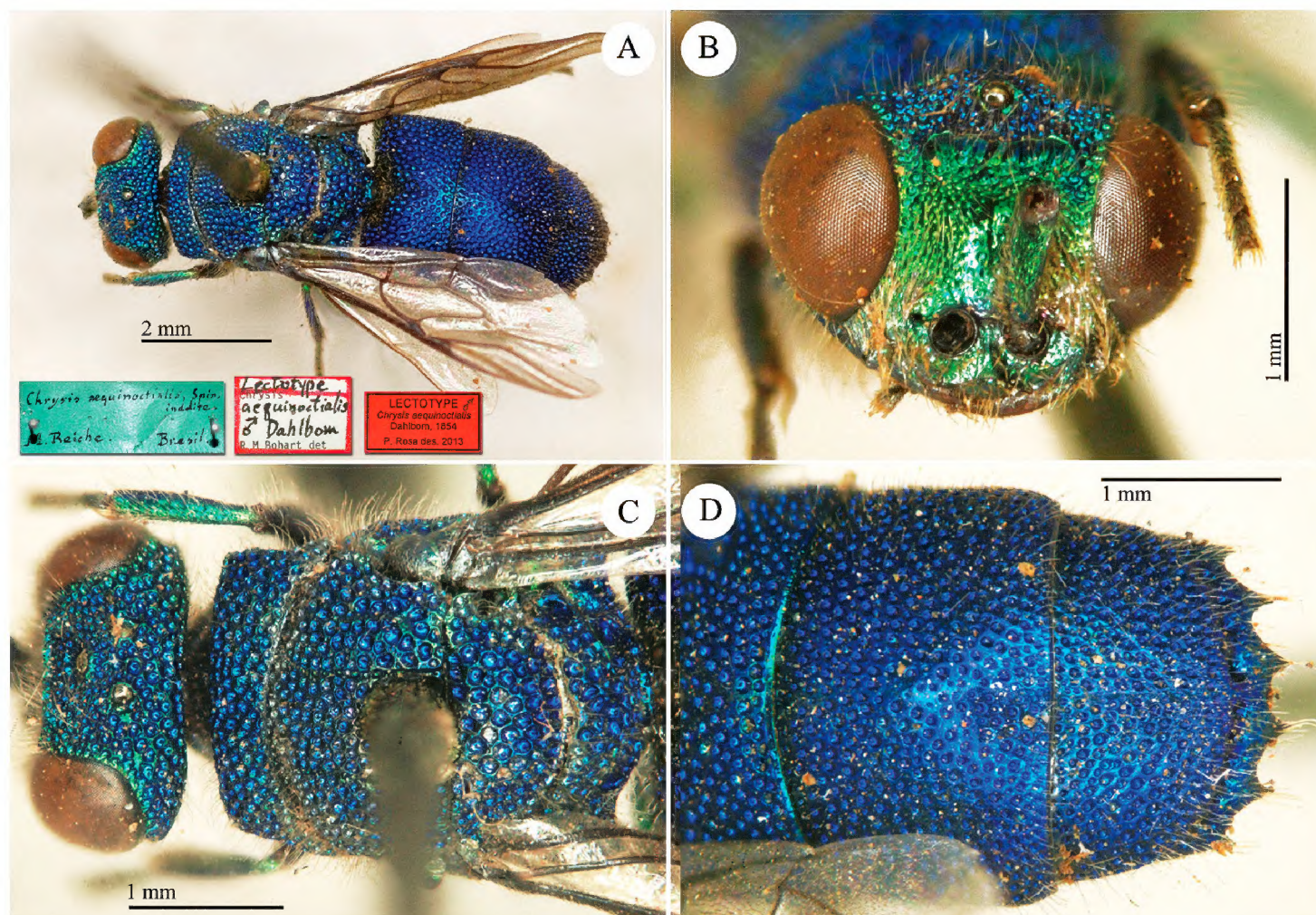
**Material. Lectotype** (here designated) ♂. *Chrysis analis* Spin. Ins. Lig. - non Meg. [erle] D. Ghiliani Genes [Genova] Espagne.

**Paralectotype** 1 ♂. Idem.

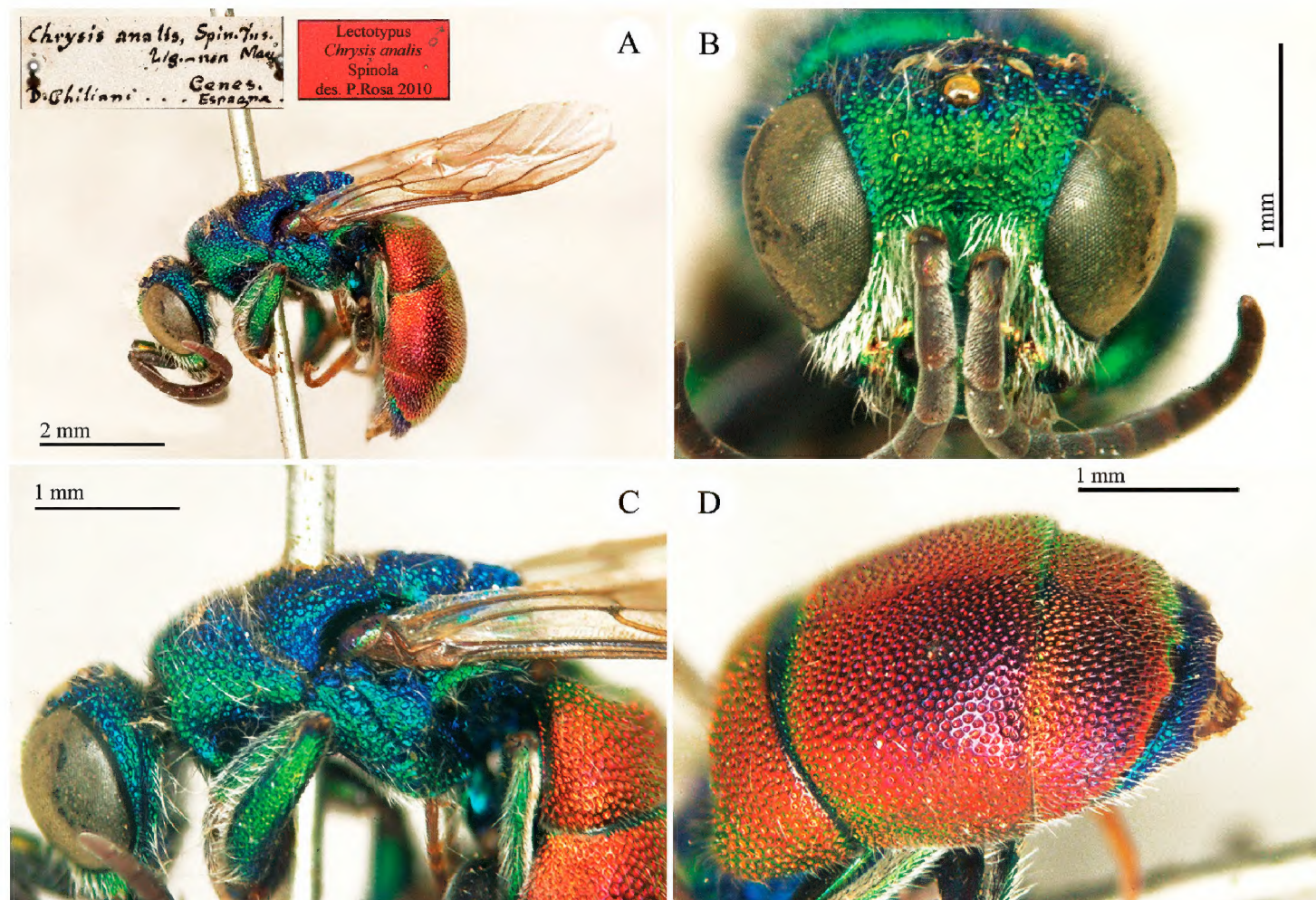
**Catalogue Casolari & Casolari Moreno.** *Chrysis analis*, 1, 110/101, 33, 5 (box 51).

**Remarks.** Spinola (1808) described *C. analis* based on a series of specimens: "*Habitat passim in Liguria, haud infrequens*". Today there are six specimens in the Spinola collection that refer to *C. analis*, even though Casolari and Casolari (1980: 79) listed only five. One specimen bears a rounded label that was likely acquired after the description of the species. Two other specimens bear handwritten labels. However, the handwriting is not by Spinola and thus the specimens cannot be considered as type material; they were very likely collected by Ghiliani in Spain and later





**Plate 1.** *Chrysis aequinoctialis* Dahlbom, lectotype. **A** Habitus, dorsal view **B** head, frontal view **C** head and mesosoma, dorsal view **D** metasoma, dorsal view.



**Plate 2.** *Chrysis analis* Spinola, lectotype. **A** Habitus, lateral view **B** head, frontal view **C** head and mesosoma, lateral view **D** metasoma, dorso-lateral view.



sent to Spinola, as reported on the white label at the base of the series. One specimen is a male of *C. splendidula* Rossi. The remaining two specimens were collected at Genoa, as reported on the main underlying white label. Since there are different species found in the type series, we designate as lectotype of *C. analis* Spinola an undamaged male that matches Spinola's description of this species and the current interpretation of the species by most currently active authors. It belongs to the *comparata-scutellaris* group.

**Current status.** *Chrysis analis* Spinola, 1808.

### ***Chrysis armena* Dahlbom, 1854**

*Chrysis armena*: Dahlom 1854: 274.

**Type locality.** "Habitat in Armenia, a D. Osculati detecta, Mus. D. Spinola".

**Material. Holotype** ♂. *Chrysis armena* Spin. D. Osculati Arménie.

**Catalogue Casolari & Casolari Moreno.** *Chrysis armena*, 1, 22, 65, 1 (box 51).

**Remarks.** It belongs to the *pallidicornis* group.

**Current status.** *Chrysis pallidicornis* Spinola, 1838 (synonymised by Mocsáry 1887: 13).

### ***Chrysis assimilis* Dahlbom, 1854**

Plate 3

*Chrysis assimilis*: Dahlbom 1854: 201.

**Type locality.** "Habitat in Sicilia et Aegypto. Tria specimina lustravi: unum a D. Grohmann in Sicilia lectum, Mus. Vienn. teste D. Kollar; alterum e Stansnio a D. Loew communicatum, tertium ex Aegypto D. Walt, Mus. D. Spinola".

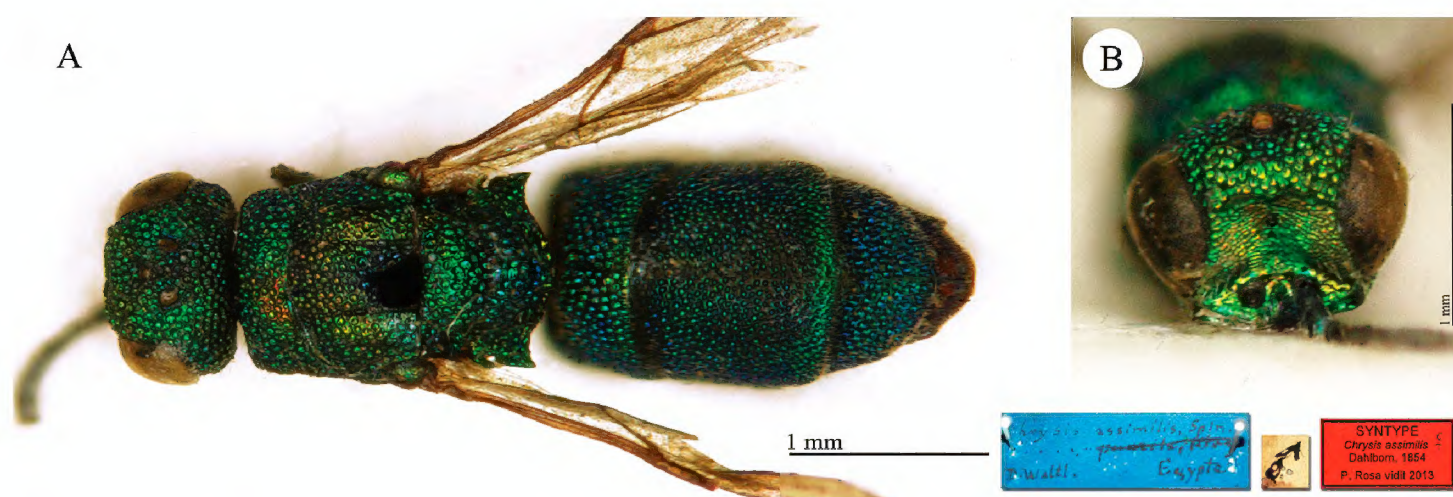
**Material. Lectotype** (here designated) ♀. *Chrysis assimilis* Spin. D. Waltl. Égypte.

**Catalogue Casolari & Casolari Moreno.** *Chrysis assimilis*, 1, 23, 95, 1 (box 51).

**Remarks.** Dahlbom (1854) described *C. assimilis* based on three syntypes. The Egyptian syntype is still in Spinola's collection. The second syntype is apparently lost. The third syntype from Sicily is housed in NHMW. *C. assimilis* was considered as a valid species by different authors: Abeille (1879: 41), Gogorza (1887: 51), De Stefani (1888: 138), du Buysson (in André), 1893: 233). However, after publication of Mocsáry's seminal monograph on cuckoo wasps (1889: 183), *C. assimilis* was considered by most authors as a synonym of *C. pumila* Klug, 1845.

Mocsáry (1889) placed all the known species relating to the genus *Chrysidea* Bischoff in synonym with *Chrysis pumila* (*C. assimilis* Dahlbom, *C. virgo* Abeille, *C. tarsata* Tournier, and *C. persica* Radoszkowski), and most authors followed this interpretation (Dalla Torre 1892: 37; Bischoff 1913: 35; Trautmann 1927: 102; Berland and Bernard 1938: 70; Linsenmaier 1951: 62; Balthasar 1953: 170).





**Plate 3.** *Chrysis assimilis* Dahlbom, lectotype **A** Habitus, dorsal view **B** head, frontal view.

Linsenmaier (1959: 171) recognized different species and subspecies of *Chrysidea* in Europe and the Mediterranean region and he listed characteristics to identify them. He treated *Chrysidea* Bischoff as a subgenus of *Chrysis* Linnaeus and considered *C. pumila* Klug and *C. persica* Radoszkowski as valid species, speculated about *C. assimilis* Dahlbom, 1854, possibly being a synonym of *C. persica*, and he described a new subspecies *C. pumila*: ssp. *disclusa*. A few years later, Linsenmaier (1987: 155) stated that *C. pumila sensu* auctorum does not occur at the species' typical locality and consequently suggested synonymizing *C. persica* and *C. pumila*. He described the species previously named *C. pumila* as *Chrysis (Trichrysis) pumilionis* n. sp. Linsenmaier (1987: 155) and also assigned it the subspecies *disclusa* Linsenmaier, 1959. This combination is erroneous for nomenclatural reasons, and the name *C. disclusa* obviously has date priority over *C. pumilionis*, as already stated by Niehuis (2001: 122). Currently, the species belonging to the *C. pumila* group are included in the genus *Chrysidea* Bischoff, 1910 (Kimsey and Bohart 1991).

We examined both available syntypes of *C. assimilis* Dahlbom. They belong to two different species: the Egyptian specimen housed in MRSN is a female of *C. persica* (*sensu* Linsenmaier 1959 = *C. pumila sensu* Linsenmaier 1987); the Sicilian specimen housed in the NHMW is a male of *C. pumila disclusa* (*sensu* Linsenmaier 1959 = *C. pumilionis disclusa sensu* Linsenmaier 1987).

Since there is no stability in the species names of the genus *Chrysidea*, we propose to designate a neotype of *C. pumila* Klug, 1845 and a lectotype of *C. assimilis* Dahlbom, 1854.

As neotype of *C. pumila* Klug, 1845, we designate a male housed in Linsenmaier's collection. The type locality of *C. pumila* is Ambukhol, once being in Egypt, nowadays in North Sudan. Since there are no available specimens from the type locality in any visited European museum, the specimen selected as neotype was collected in the closest locality to Ambukhol known to us. Specifically, it was collected in Egypt and bears the following locality label: Aegypten Fayoum H. Suster 9.1948 Coll. Linsenmaier. The designation of this specimen as neotype of *C. pumila* retains Linsenmaier's interpretation (1987 and following papers) of the species and that most European Hymenopterists adopted. We agree with Linsenmaier's interpretation of the species, since *C. pumila sensu* Linsenmaier (1959) seems to be restricted in its occurrence to central and southern Europe. Mocsáry (1909: 406) was the last author to examine Klug's type of *C. pumila* in MNHU. We searched for this type together the curator, Dr. Frank Koch, and his assistant, Viola Richter, at the MNHU, but in



vain. All taxa deposited at MNHU are registered with an index card that includes information on the type status of each specimen. Klug's types are registered with a red "T" [Type], except in the case of *pumila*, which is marked with a "T" written with drawing pencil. The type possibly had been lost already during compilation of the index cards.

As lectotype of *C. assimilis* Dahlbom, 1854, we designate a specimen housed in the Spinola collection labelled: *Chrysis assimilis* Spin. D. Walzl Égypte. This designation retains the synonymy of *C. assimilis* Dahlbom, 1854 and *C. pumila* Klug, 1845. In fact, a lectotype designation based on the Sicilian type specimen housed at NHMW would have caused nomenclatorial stability in the genus *Chrysidea* since *C. assimilis* is the second available name described.

In Europe and in the Mediterranean region, there are currently four known species and one subspecies of *Chrysidea*: *C. asensioi* Mingo, 1985 (distribution: Spain, south France, north Italy, Greece); *C. disclusa* Linsenmaier, 1959 (Spain, south France, Italy, Sicily, north Africa); *C. pumila* Klug, 1845 (Transpalaeartic: from the Iberian peninsula and northern Africa to China; Afrotropical); *C. disclusa pumilionis* Linsenmaier, 1987 (Austria, Croatia, Czech Republic, France, Germany, Greece, Hungary, Macedonia, Morocco, Spain, Switzerland); *C. rebecca* Morice, 1909 (Palestine, Syria).

**Current status.** *Chrysidea pumila* (Klug, 1845) (synonymised by Mocsary 1887: 13; and transferred by Kimsey and Bohart 1991: 314).

### ***Chrysis basalis* Dahlbom, 1854**

Plate 4

*Chrysis basalis*: Dahlbom 1854: 106.

**Type locality.** "Habitat in Algeria; D. Rambur, Mus. Spinolae".

**Material. Holotype** ♂. *Chrysis basalis* Dlbm. D. Rambur Algérie.

**Catalogue Casolari & Casolari Moreno.** *Chrysis basalis*, 1, 154, 23, 1 (box 50).

**Remarks.** It belongs to the *C. millenaris* group.

**Current status.** *Chrysis basalis* Dahlbom, 1854.

### ***Chrysis bihamata* Spinola, 1838**

Plate 5

*Chrysis bihamata*: Spinola 1838: 450.

**Type locality.** "Égypte".

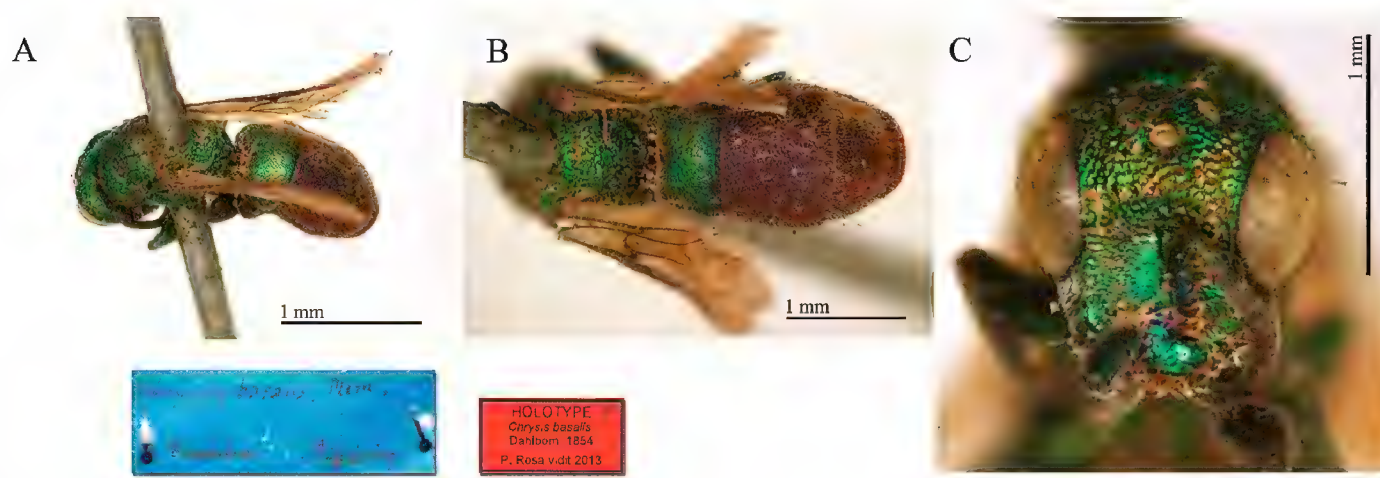
**Material. Lectotype** (here designated) ♀. *Chrysis bihamata* Spin. D. Walzl Égypte.

**Paralectotype** 1 ♀. idem.

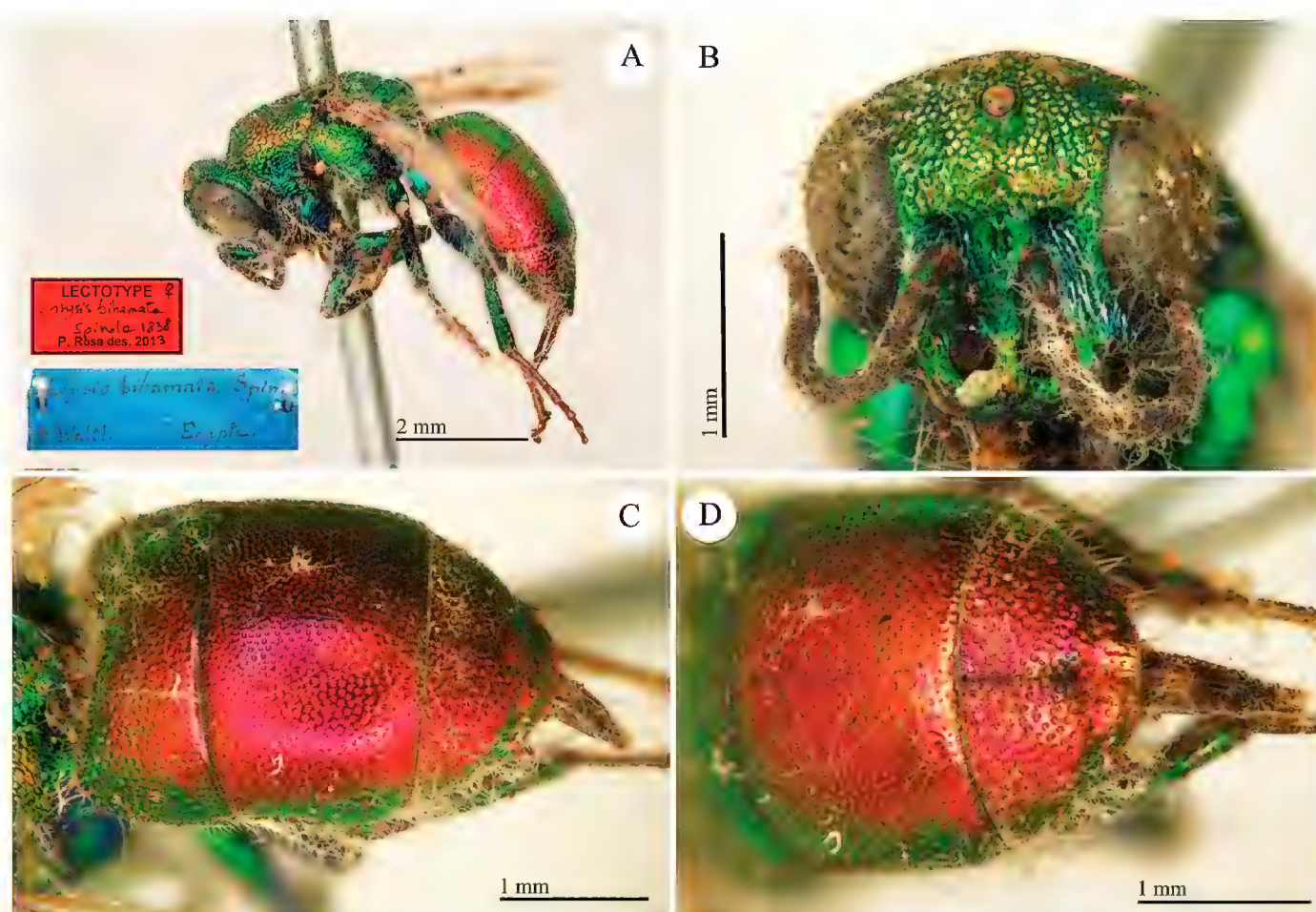
**Catalogue Casolari & Casolari Moreno.** *Chrysis bihamata*, 1, 23, 95, 2 (box 51).

**Remarks.** There are two syntypes of *Chrysis bihamata* in the Spinola collection. The first syntype was heavily damaged by a dermestid attack and it is almost unrecognizable.





**Plate 4.** *Chrysis basalis* Dahlbom, holotype **A** Habitus, dorso-lateral view **B** mesosoma and metasoma, dorsal view **C** head, frontal view.



**Plate 5.** *Chrysis bihamata* Spinola, lectotype. **A** Habitus, lateral view **B** head, frontal view **C** metasoma, dorso-lateral view **D** second to third metasomal tergites, dorsal view.

Therefore, we designate the second specimen, currently being in good condition, as lectotype. It is only partially covered by an old mould layer. *C. bihamata* is the first species described in the *C. bihamata* group.

**Current status.** *Chrysis bihamata* Spinola, 1838.

### *Chrysis carinata* Dahlbom, 1854

*Chrysis carinata*: Dahlbom 1854: 167 *nec* Block, 1799.

**Type locality.** "Habitat in Africa, ad Cap. bon. sp. a D. Draege detecta; Mus. Spinolae".



**Material. Holotype** (sex unknown): *Chrysis carinata* / (*Nemophora*) Draege / D. Draege Cap. B. Esp.

**Catalogue Casolari & Casolari Moreno.** *Chrysis carinata*, 45, 53, 21, 1 (box 50).

**Remarks.** In the original description, Dahlbom (1854: 168) listed also the name *Nemophora carinata* Draege, the same name found on the label pinned with the specimen in the Spinola collection. The type is seriously damaged, only its mesosoma exists. It belongs to the *C. oxygona* group.

**Current status.** *Chrysis capensis* Mocsáry (1887: 14), replacement name for *Chrysis carinata* Dahlbom, 1854 (*nec* Block, 1799).

### ***Chrysis chilensis* Spinola, 1851**

Plate 6

*Chrysis chilensis*: Spinola 1851: 404.

**Type locality.** Chile "Esta especie es bastante comun en Chile y principalmente en las cercanias de Coquimbo, Illapel, etc.".

**Material. Lectotype** (here designated) ♂. *Chrysis chiliensis* (sic!), Spin. / M. Gay / Chili.

**Paralectotypes** 2♀♀. idem.

**Catalogue Casolari & Casolari Moreno.** *Chrysis chiliensis*, 1, 52, 32, 3 (box 51).

**Remarks.** *C. chilensis* was described based on a syntype series that included males and females. Other syntypes are housed in LZM (Dahlbom's collection) and MNHN (du Buysson 1898: 166).

Gay (1851: 404) erroneously assumed that *C. chilensis* Spinola was described in 1845 in Atlas Zoologico, Entomologia, Himenópteros, tav. 4, fig. 6. The same author therefore also considered *C. chilensis* a senior subjective synonym of *C. grandis* Brullé, 1846. Currently, *C. chilensis* Spinola, 1851 is considered a junior subjective synonym of *C. grandis* Brullé, 1846. Since we could not find the reference "Atlas Zoologico" cited by Gay, we consider *C. chilensis* Spinola, 1851 as the junior synonym of *C. grandis* Brullé, 1846. We designate the male specimen, still being in good condition, as the lectotype. It belongs to the *C. grandis* group.

**Current status.** *Chrysis grandis* Brullé, 1846 (synonymised by Mocsáry 1889: 404).

### ***Chrysis comparata* Lepeletier, 1806**

Plates 7, 8

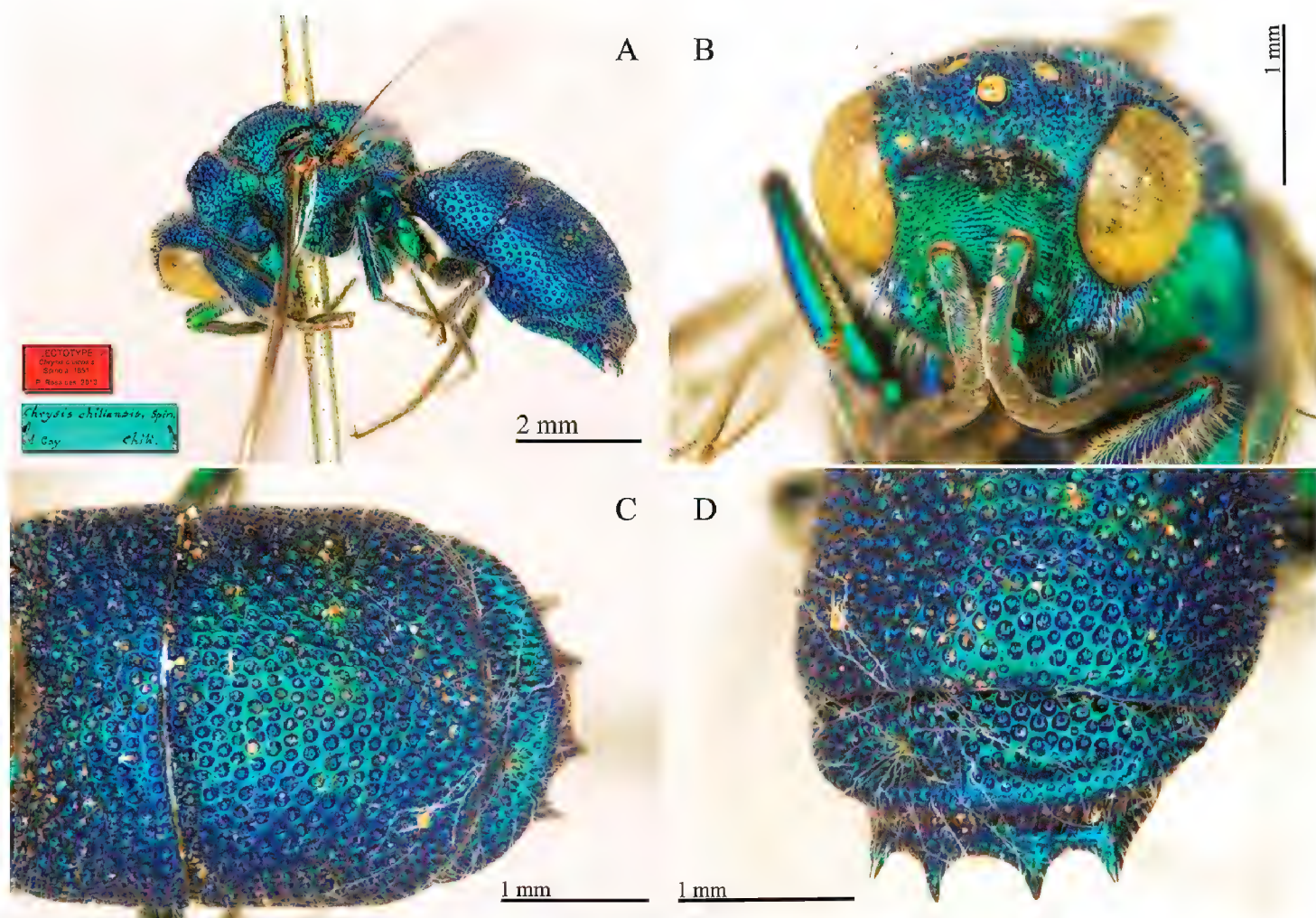
*Chrysis comparata*: Lepeletier 1806: 127.

**Type locality.** France "Meudon".

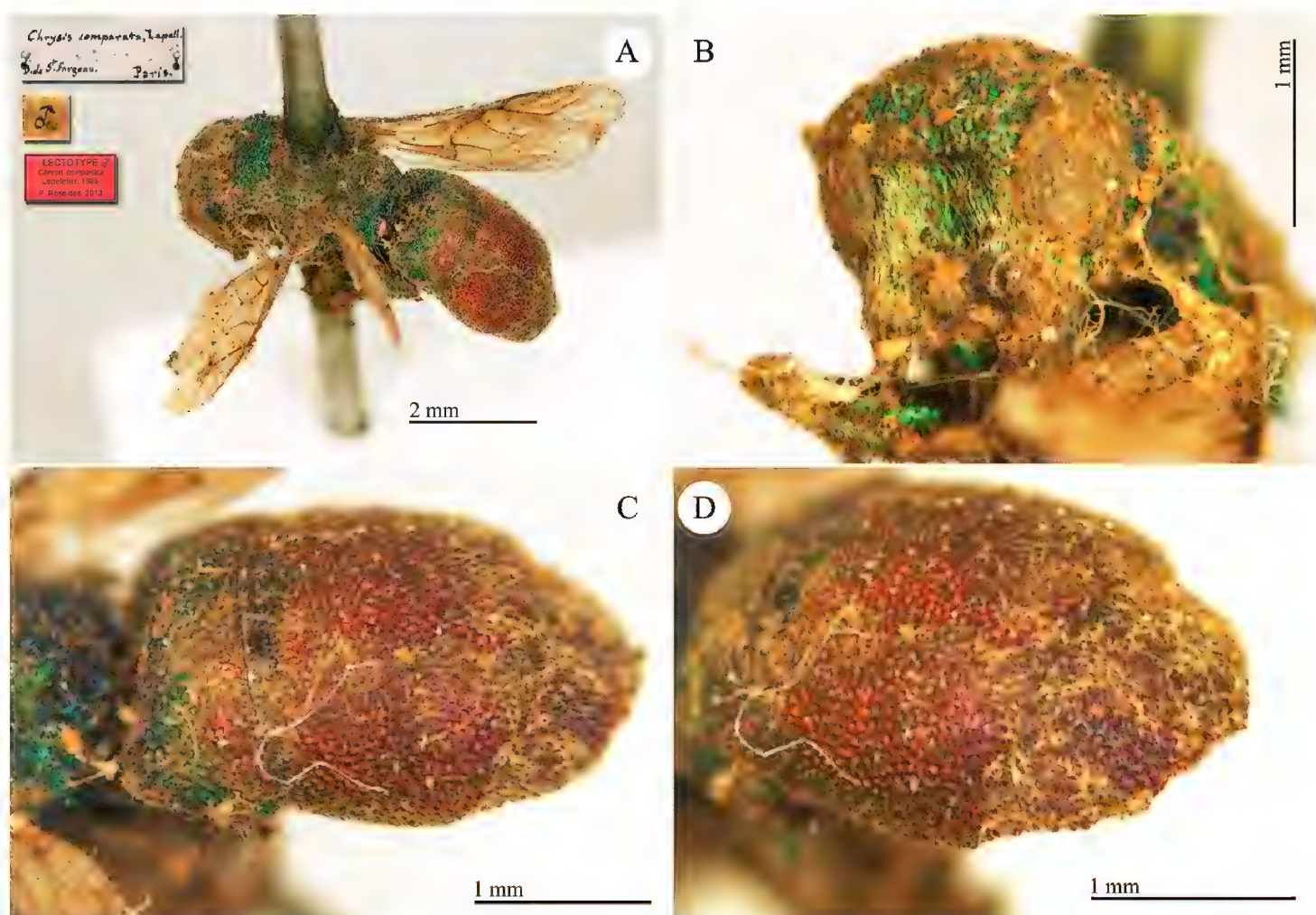
**Material. Syntypes** 2♂♂. *Chrysis comparata*, Lepell. / D. De St. Fargeau, Paris.

**Neotype** (here designated) ♀. Sicile et Toscane / **Lectotype** ♀ *Chrysis distinguenda* Dhlb. P. Rosa des. 2012 / **Neotypus** *Chrysis comparata* Lepeletier des. P. Rosa 2013.



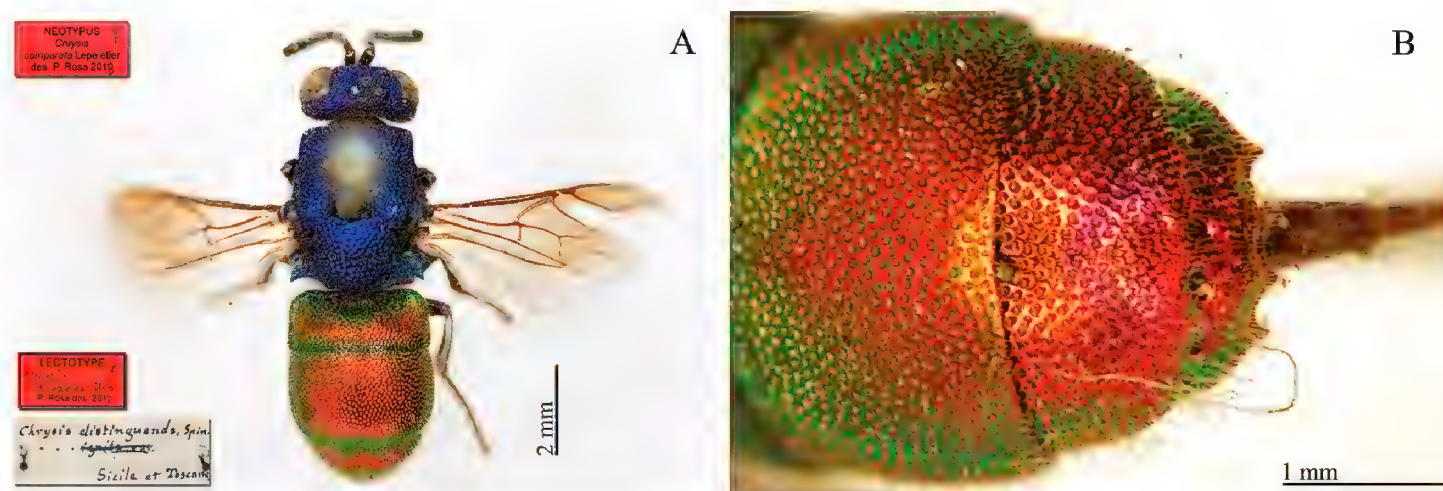


**Plate 6.** *Chrysis chilensis* Spinola, lectotype. **A** Habitus, lateral view **B** head, frontal view **C** metasoma, dorsal view **D** second and third metasomal tergites, dorso-lateral view.



**Plate 7.** *Chrysis comparata* Lepeletier, lectotype. **A** Habitus, dorsal view **B** head, frontal view **C** metasoma, dorso-lateral view **D** second and third metasomal tergites, dorso-lateral view.





**Plate 8.** *Chrysis distinguenda* Dahlbom, lectotype; *Chrysis comparata* Lepeletier, neotype **A** Habitus, dorsal view **B** second and third metasomal tergites, dorsal view.

**Catalogue Casolari & Casolari Moreno.** *Chrysis comparata*, 148, 185, 53, 3 (box 51).

**Remarks.** In the Spinola collection, there are two identical specimens of *C. comparata* according to their general habitus, preparation and state of conservation. The type is likely housed in the Spinola collection, given that both Dahlbom (1854: 284) and Abeille (1879: 69) examined it there. Kimsey and Bohart (1991: 399) listed syntype males and they assumed to be housed in MNHN. However, they refer to some specimens cited by du Buysson (1898: 166) not included to the type series. In any case, the type of *C. comparata* is not housed in MNHN (du Buysson 1899) and was not found during our research.

It is evident that Lepeletier's description and drawing (Tav.1, fig.12) of *C. comparata* does not match the current interpretation of the species. It rather perfectly matches the description of the male of *Chrysis pyrophana* Dahlbom, 1854. No other European species, in comparison, has such small body length, colour of head, mesosoma and the anterior part of T-I green-blue combined with the anal margin with four blunt and weakly developed teeth. The interpretation of *C. comparata* (= male of *C. pyrophana*) was clear to Dahlbom (1854), Mocsáry (1889: 431) and Dalla Torre (1892: 52). Dahlbom (1854: 284) described the female under the name of *Chrysis pyrophana* Dahlbom, 1854, because of the remarkable sexual dimorphism.

Dahlbom (1854: 282) described *Chrysis comparata* in the modern sense under the name *Chrysis distinguenda* Dahlbom (*nec* Spinola, 1838). Mocsáry (1879: 10) recognized the homonymy with Spinola's *C. distinguenda* and replaced the name *C. distinguenda* Dahlbom with the name *Chrysis chevrieri* Mocsáry (*nec* Abeille, 1877). This name remained in use for a long time in European collections.

The first wrong interpretation of this taxon dates back to Abeille (1879). His incorrect interpretation was already recognized by Mocsáry (1887: 14; 1889: 479), who included *Chrysis comparata sensu* Abeille in the synonymic list of *Chrysis chevrieri* Mocsáry, 1879. Please note that Abeille (1879) additionally independently described the male of *C. pyrophana* Dahlbom, 1854 under the name *C. insoluta*.

Mocsáry (1889: 431) correctly recognized the synonymy *C. insoluta* Abeille = *C. comparata* Lepeletier. Later, Bischoff (1913: 49) interpreted the name *comparata* Lepeletier as referring to females of *C. distinguenda* Dahlbom and *C. chevrieri* Mocsáry as well as the male of *pyrophana* (= *insoluta* Abeille).



The current (mis-) interpretation of the species *Chrysis comparata* was anchored in the taxonomic literature by Trautmann (1927: 154). His *C. comparata* is a large and robust species, with the entire metasoma golden, without the typical green-blue. Berland and Bernard (1938: 113) followed this interpretation, and so did Linsenmaier (1959: 148).

According to the Principle of Priority, *C. pyrophana* Dahlbom, 1854 should be named *C. comparata* Lepeletier, 1806 and the species currently identified as *C. comparata* Lepeletier should be named *C. miegii* Guérin, 1842, the first available name for this species. However, this change would compromise the nomenclatural stability, since the name *C. comparata* was recognized as a valid name for one of the most common European species by nearly all the authors in the last fifty years.

As already observed by Abeille (1879), the Spinola collection houses the type of *C. distinguenda* Dahlbom. This name was considered as a synonym of *C. comparata sensu auctorum*. To preserve the stability of nomenclature, we designate the neotype of *C. comparata* Lepeletier (Plate 8) based on a syntype ♀ of *C. distinguenda* Dahlbom (labels: Sicile et Toscane / **Lectotype** ♀ *Chrysis distinguenda* Dhlb. P. Rosa des. 2012 / **Neotypus** *Chrysis comparata* Lepeletier des. P. Rosa 2013), in accordance with Art. 75.6 of the Code: Conservation of prevailing usage by a neotype. The Article states that when an author discovers that the existing name-bearing type of a nominal species-group taxon is not in taxonomic accord with the prevailing usage of names and stability or universality is threatened thereby, he should maintain prevailing usage [Art. 82] and request the Commission to set aside under its plenary power [Art. 81] the existing name-bearing type and designate a neotype. It belongs to the *comparata-scutellaris* group.

**Current status.** *Chrysis comparata* Lepeletier, 1806.

### *Chrysis cuprea* Brullé, 1846

*Chrysis cuprea*: Brullé 1846: 40 *nec* Rossi, 1790.

**Type locality.** "Hab.[itat] le Cap de Bonne-Espérance. Collect. de M. Serville".

**Material. Holotype** ♀. *Chrysis cuprea* Brullé / Coll. Serv.[ille], Cap B.[one] Esp.[érance].

**Catalogue Casolari & Casolari Moreno.** *Chrysis cuprea*, 13, 53, 79, 1 (box 51).

**Remarks.** The type is badly damaged, only the mesosoma remains.

**Current status.** *Chrysis mutata* Mocsáry, 1882 (Mocsáry 1882: 50), replacement name for *Chrysis cuprea* Brullé 1846.

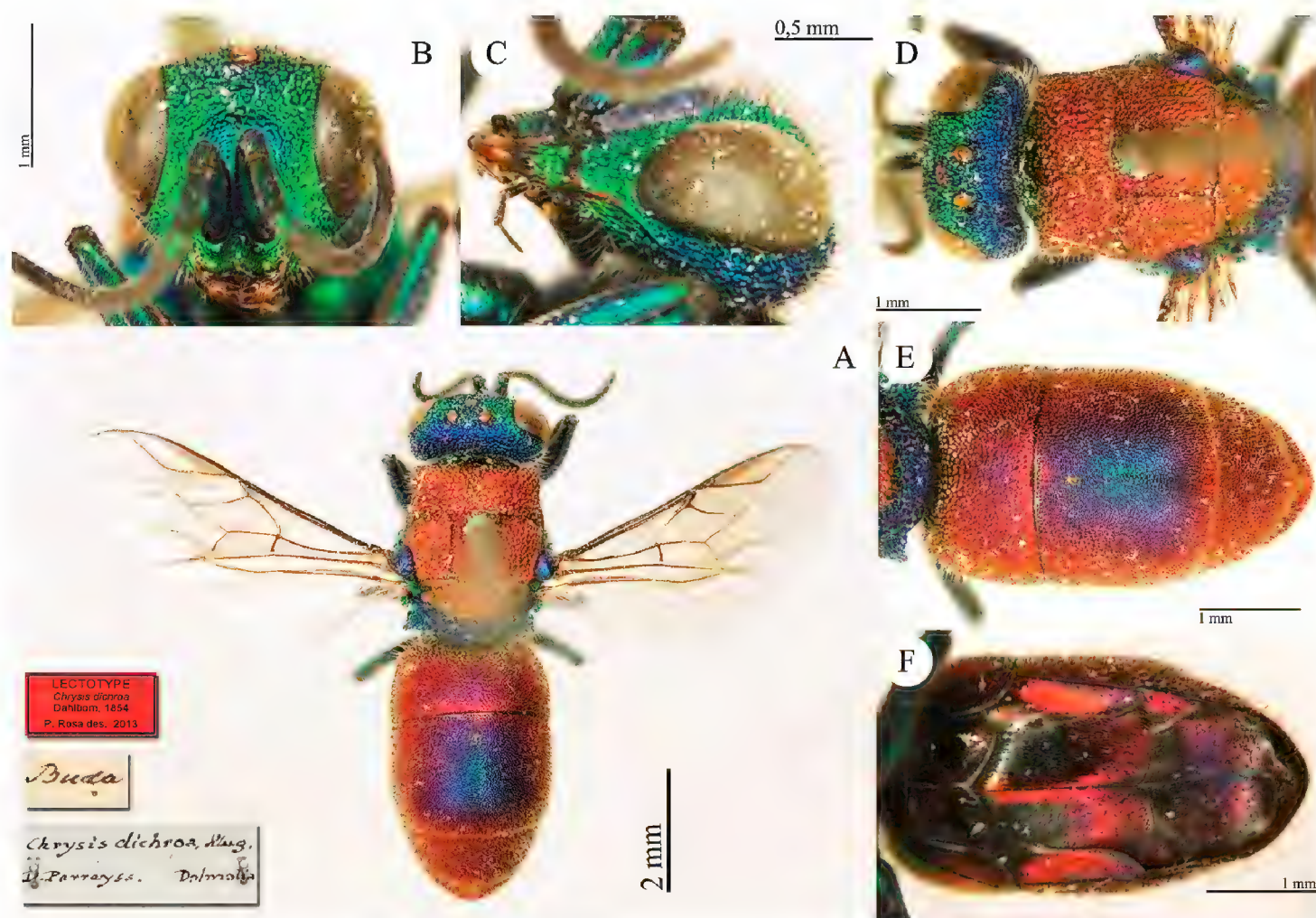
### *Chrysis dichroa* Dahlbom, 1854

Plate 9

*Chrysis dichroa*: Dahlbom 1854: 146.

**Type locality.** "Habitat in Austria D. D. Klug, Kollar, Parreys et Spinola; in Italia ad Buda, D. Zeller; in Asia minori ad Ephesum mense Aprili 1842, D. Loew".





**Plate 9.** *Chrysis dichroa* Dahlbom, lectotype. **A** Habitus, dorsal view **B** head, frontal view **C** head, lateral view **D** head and mesosoma, dorsal view **E** metasoma, dorsal view **F** metasoma, ventral view.

**Material. Lectotype** (here designated) ♀. *Chrysis dichroa*, Klug / D. Parreyss, Dalmatia // Buda.

**Catalogue Casolari & Casolari Moreno.** *Chrysis dichroa* 132, 81, 68, 3 (box 50).

**Remarks.** Dahlbom (1854) described *C. dichroa* based on a syntypic series of specimens collected in Austria, Hungary (Buda, not Italy) and Turkey (Ephesus) lent by Klug, Kollár, Parreys, Spinola, Zeller, and Loew. The female syntype housed in the Spinola collection matches the current interpretation of the species and we designate it as a lectotype. The designation is necessary because during the last five decades, Linsenmaier (1959, 1968) and Arens (2001) described numerous species of the *C. dichroa* group collected in the Eastern Mediterranean region. Therefore, there is the possibility that syntypes of *C. dichroa* from Turkey could now belong to a different species. It belongs to the *C. dichroa* group.

**Current status.** *Chrysura dichroa* (Dahlbom, 1854) (transferred by Kimsey and Bohart 1991: 488).

### *Chrysis distinctissima* Dahlbom, 1854

*Chrysis distinctissima*: Dahlbom 1854: 211.

**Type locality.** "Habitat in America meridionali".



**Material. Syntype** 1 ♂. *Chrysis distinctissima* / Dlbm. - *Chr. fasciata*, m. / D. Buquet, Cayenna // **Holotype** ♂. *Chrysis intricans* Spinola, R. M. Bohart det. // **Lectotype** ♂. *Chrysis distinctissima* Dahlbom, R. M. Bohart det.

**Catalogue Casolari & Casolari Moreno.** *Chrysis distinctissima*, 27, 56, 1, 2 (box 51).

**Remarks.** Spinola (1840: 202) gave the diagnosis of a male belonging to *Chrysis fasciata* Fabricius, 1804 (*nec* Olivier, 1790), collected at Cayenna in French Guyana by Leprieur and received via Buquet. In the same diagnosis, Spinola (1840: 203) described *Chrysis intricans* Spinola, 1840 ("n. sp.", giving a complete description), based on a second specimen: "Celle-ci ne fait pas partie des récoltes de M. Leprieur, et elle est étrangère au sujet de ce Mémoire; je me contenterai d'en constater l'existence, et de signaler les traits qui la distinguent de notre n°50". Therefore, there should be theoretically both a specimen of *C. fasciata* Fabricius *sensu* Spinola as well as a holotype of *C. intricans* Spinola in the Spinola collection.

Dahlbom (1854: 211) described *C. distinctissima* based on one specimen examined in 1847 at LZM and on a second specimen loaned by Spinola under the name *C. intricans*. He considered as *C. distinctissima* also *C. fasciata* Spinola (*nec* Fabricius). In particular, Dahlbom listed in the type series: "*Chrysis fasciata* Spinol. Annal. Ent. 1840. 202: 50"; then the specimen from Lund; lastly the specimen known as *C. intricans* "Mus. Spinolae", without further remarks. Two pages after, Dahlbom (1854: 213) listed under the name *C. coeruleans* Fabricius a second specimen from the Spinola collection named *C. intricans* collected at Cayenne and received by Buquet. This specimen should correspond to the holotype of *C. fasciata* Spinola (*nec* Fabricius). The Spinola collection does not house any sample labelled "*C. intricans*", but it houses two specimens label "*Chrysis distinctissima* Dlbm – *Chr. fasciata* m.[ihi]". The first is severely damaged, having no metasoma. The second is in good condition. The first was labelled by Bohart as holotype of *C. intricans* and lectotype of *C. distinctissima*; the second specimen was labelled by Bohart as *C. excavata* Brullé, 1846. The lectotype designation of *C. distinctissima* has not been published. In Dahlbom's collection in LZM, there are no labels referring to *C. distinctissima* Dahlbom and there is only one specimen labelled *C. fasciata* Fabricius. Unfortunately, we currently cannot confidently infer which specimen could be the type of one species and which one could be the type of the second species, since Spinola's descriptions are ambiguous. According to Kimsey and Bohart (1991) it belongs to the *C. intricans* group.

**Current status.** *Chrysis distinctissima* Dahlbom, 1854.

### *Chrysis distinguenda* Dahlbom, 1854

Plate 8

*Chrysis distinguenda*: Dahlbom 1854: 282 *nec* Spinola, 1838.

**Material. Lectotype** (here designated) ♀. *Chrysis distinguenda*, Spin.; Sicile et Toscane.

**Paralectotypes** 3 ♀♀. *idem*.

**Catalogue Casolari & Casolari Moreno.** *Chrysis distinguenda*, 1, 204/96, 0, 4 e 0, 96, 85, 3 (box 51).



**Paralectotype** 1 ♀. *Chrysis distinguenda*, 1 ♀ aut potius *Chr. ignita*, var. *a* ?; D. de Sanvitali. Toscana.

**Catalogue Casolari & Casolari Moreno.** *Chrysis distinguenda* 0, 96, 85, 3 (box 51).

**Remarks.** Dahlbom (1854: 282) described *C. distinguenda* Dahlbom (*nec* Spinola, 1838) based on a unspecified number of specimens housed in the Spinola collection. He knew that Spinola did not include these specimens in his description of *C. distinguenda* Spinola, 1838. In fact, Dahlbom explicitly wrote: "*Chrysis distinguenda* Mus. Spinolae (*non Annales Entomol.* 1838. 450: VII, *quae species est toto corpore cyaneo-viridis*)". Dahlbom (1854) gave a new accurate description of *C. distinguenda* Dahlbom, more than two pages with some drawings. Mocsáry (1879, 1889) realized that *C. distinguenda* Dahlbom a synonym of *comparata sensu* auctorum, and that *C. distinguenda* Spinola most likely represented a separate and unknown species, the type of which apparently has been lost. Mocsáry (1879) replaced the name *C. distinguenda* Dahlbom, 1854 (*nec* Spinola, 1838) with *C. chevrieri nec* Abeille, 1879. Finally, Linsenmaier (1999: 221) considered *C. distinguenda* Spinola as a separate species belonging to the *C. ignita* group, although he seemingly never studied type specimens in Spinola's collection.

We consider five specimens in the Spinola collection as syntypes of *C. distinguenda* Dahlbom, 1854. In box 51, there are two main labels bearing the name *C. distinguenda*. Under the second label, there are three specimens: the last two are males of *C. comta* Förster, 1853 and are likely the specimens listed by Spinola as *C. ignita* var. *a* on the label. We select one female syntype of *C. distinguenda* Dahlbom as neotype of *C. comparata* Lepeletier (Plate 8) (labels: Sicile et Toscane / **Lectotype** ♀ *Chrysis distinguenda* Dhlb. P. Rosa des. 2012 / **Neotypus** *Chrysis comparata* Lepeletier des. P. Rosa 2013). For further notes see remarks under *C. comparata* Lepeletier. The type of *C. distinguenda* Spinola, 1838 is currently lost (see the chapter II Types not housed in the Spinola collection).

**Current status.** *Chrysis comparata* Lepeletier, 1806 (synonymised by Trautmann 1927: 154).

### *Chrysis dives* Dahlbom, 1854

Plates 10, 11

*Chrysis dives*: Dahlbom 1854: 301 *nec Chrysis dives* Lucas, 1849.

**Type locality.** "Habitat in Sicilia, D. Grohmann; Mus. D. Spinola."

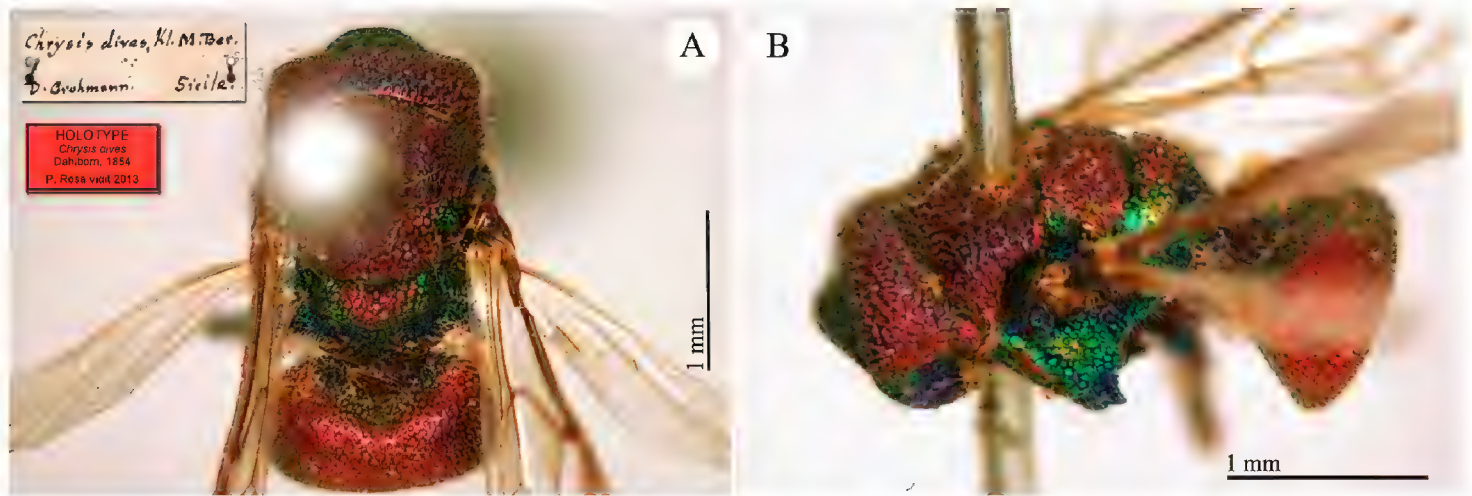
**Material. Holotype** ♀. *Chrysis dives* Kl. M. Ber. / D. Grohmann, Sicile.

**Neotype** (here designated): ♀ Rákospalota [= Budapest] 23.V.1879 leg. Biró.

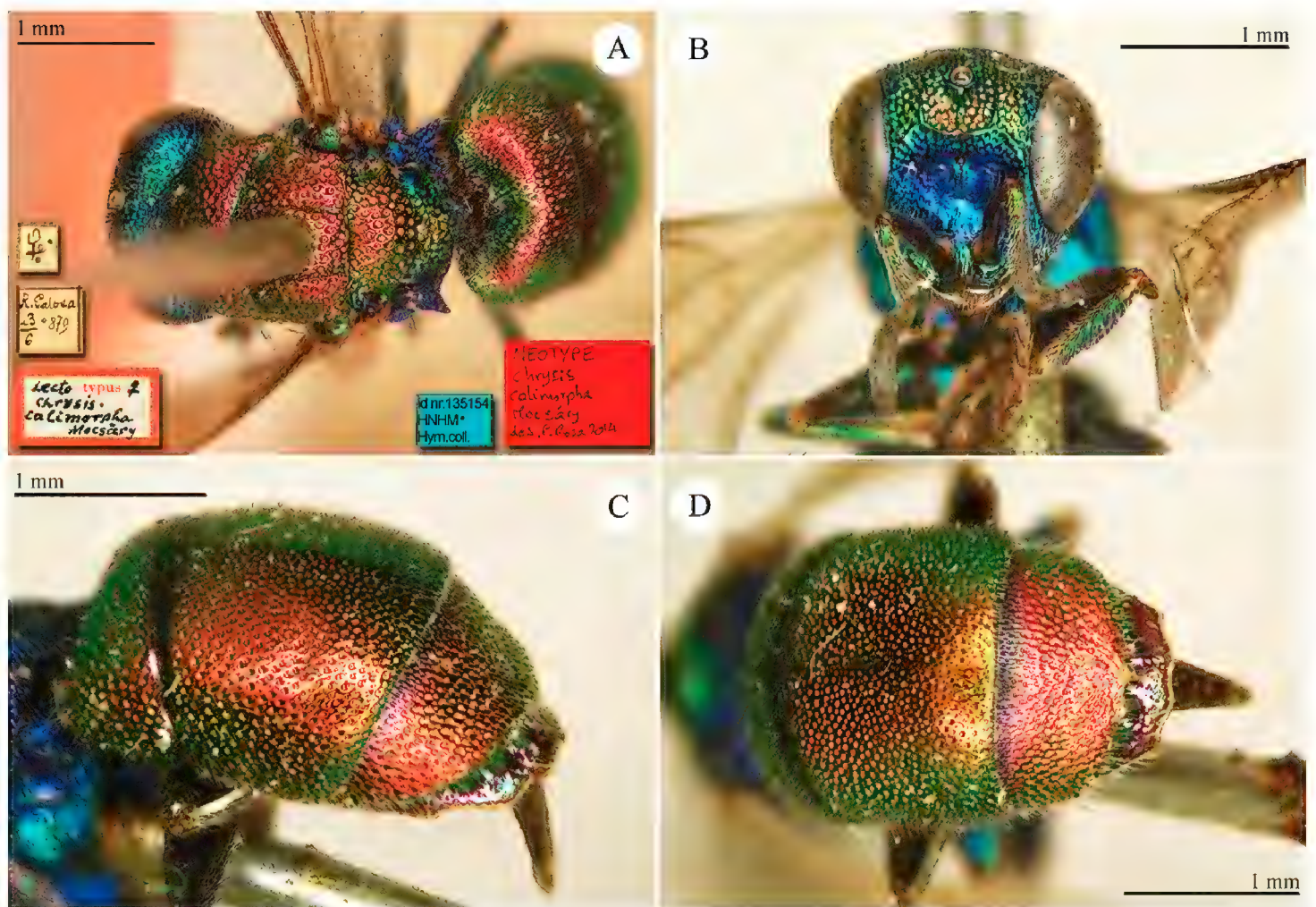
**Catalogue Casolari & Casolari Moreno.** *Chrysis dives*, 141, 204, 34, 1 (box 51).

**Remarks.** The type of *C. dives* is badly damaged, lacking its head and metasoma. Even if only the mesosoma had remained, it is clear that the current interpretation of the species does not match the type. The mesosoma clearly refers to a species that is well known under the name *C. varidens* Abeille, 1878. Dahlbom (1854: 300) consid-





**Plate 10.** *Chrysis dives* Dahlbom, holotype **A** Mesosoma and metasoma, dorsal view **B** mesosoma and metasoma, dorso-lateral view.



**Plate 11.** *Chrysis calimorpha* Mocsáry, neotype. **A** Habitus, dorsal view **B** head, frontal view **C** metasoma, lateral view **D** second and third metasomal tergites, dorsal view.

ered *C. dives* as the female (var. *b*) of *C. pulchella* Spinola, 1808, till then known only from a single male. But on the following page of his description of *C. dives* (1854: 301), Dahlbom described *C. dives* as a valid species, not as a variation of *C. pulchella*. The description does not match the current interpretation of the species. The females of *C. pulchella* and of *C. calimorpha* Mocsáry, 1882 *sensu* auctorum (replacement name for *C. dives* Dahlbom (*nec* Lucas, 1849)) have the same size and the shape as conspecific males; they differ from each other by their punctuation on the head and mesosoma, (Rosa 2005, 2006).



Mocsáry (1882: 71, 90) observed that the name *C. dives* Dahlbom, 1854 is a junior homonym of *C. dives* Lucas, 1849. Therefore, he replaced the name *C. dives* Dahlbom with *C. calimorpha* Mocsáry. In the same article, Mocsáry (1882: 71) listed two specimens of *C. calimorpha* collected in central Hungary. Later, Móczár (1965: 179) designated these two specimens as lecto- and paralectotype of *C. calimorpha*. These two Hungarian specimens do not belong to the type series, because *C. calimorpha* is the replacement name of *C. dives*. The only holotype by monotypy of this species is the Sicilian specimen housed in the Spinola collection. According to Art. 74.2 of the Code when it is demonstrated that a specimen is not a syntype, it automatically loses its status of lectotype. Móczár's lectotype is consequently set aside, since the selected specimen is not a syntype.

Given the holotype of *C. dives* Dahlbom is almost destroyed, the mesosoma clearly belongs to a different species relative to the current interpretation of *C. calimorpha sensu auctorum*, and because the history of the name *calimorpha* is complex, we will ask for the suppression of the type of *C. dives* to the Commission on the ICZN. We designate as neotype of *C. dives* the female of *C. calimorpha* Mocsáry, selected by Móczár as lectotype and bearing the following labels: Rákospalota [= Budapest] 23.V.1879 leg. Biró (Plate 11). It belongs to the *C. pulchella* group.

**Current status.** *Chrysis calimorpha* Mocsáry, 1882 (Mocsáry 1882: 71), replacement name for *Chrysis dives* Dahlbom 1854.

### *Chrysis elegans* Lepeletier, 1806

*Chrysis elegans*: Lepeletier 1806: 128.

**Type locality.** unknown.

**Material. Holotype** (?) ♀. *Chrysis elegans*, Lepell. et Dlbm. var. *a*, ♀. - *β*. id. var. *ab* / Dlbm. - *Chr. sicula*, mihi olim / D. Grohmann. Sicilia.

**Catalogue Casolari & Casolari Moreno.** *Chrysis elegans*, 164, 204, 34, 2 (box 50).

**Remarks.** Two specimens are found under the label *Chrysis elegans* in the Spinola collection. One bears a single label (*β*) and likely refers to *C. sicula* Dahlbom (see under the name *sicula*). The second specimen could be the holotype of *C. elegans* Lepeletier, 1806. The type of *C. elegans* is not housed in MNHN (du Buysson 1898). Because the second specimen above matches the sex (*femelle*) and the colour drawing (pl. 6: fig. 20) given by Lepeletier 1806 it could be the holotype that arrived in the Spinola collection together with other types (e.g. *C. comparata*).

Bohart (in Kimsey and Bohart 1991: 407) designated the lectotype of *C. elegans* Lepeletier in MNHN. This designation has to be set aside because it is based on a male (and not female as given in the description), and it was collected in Greece (the typical locality was unknown: "*Je ne sais de quel pays elle est.*"). Hence it cannot be a syntype (or a holotype, to be more accurate). The specimen selected by Bohart is not a syntype and it cannot be considered as a lectotype according to Art. 74.2. It belongs to the *C. elegans* group.

**Current status.** *Chrysis elegans* Lepeletier, 1806.



***Chrysis elegantula* Spinola, 1838**

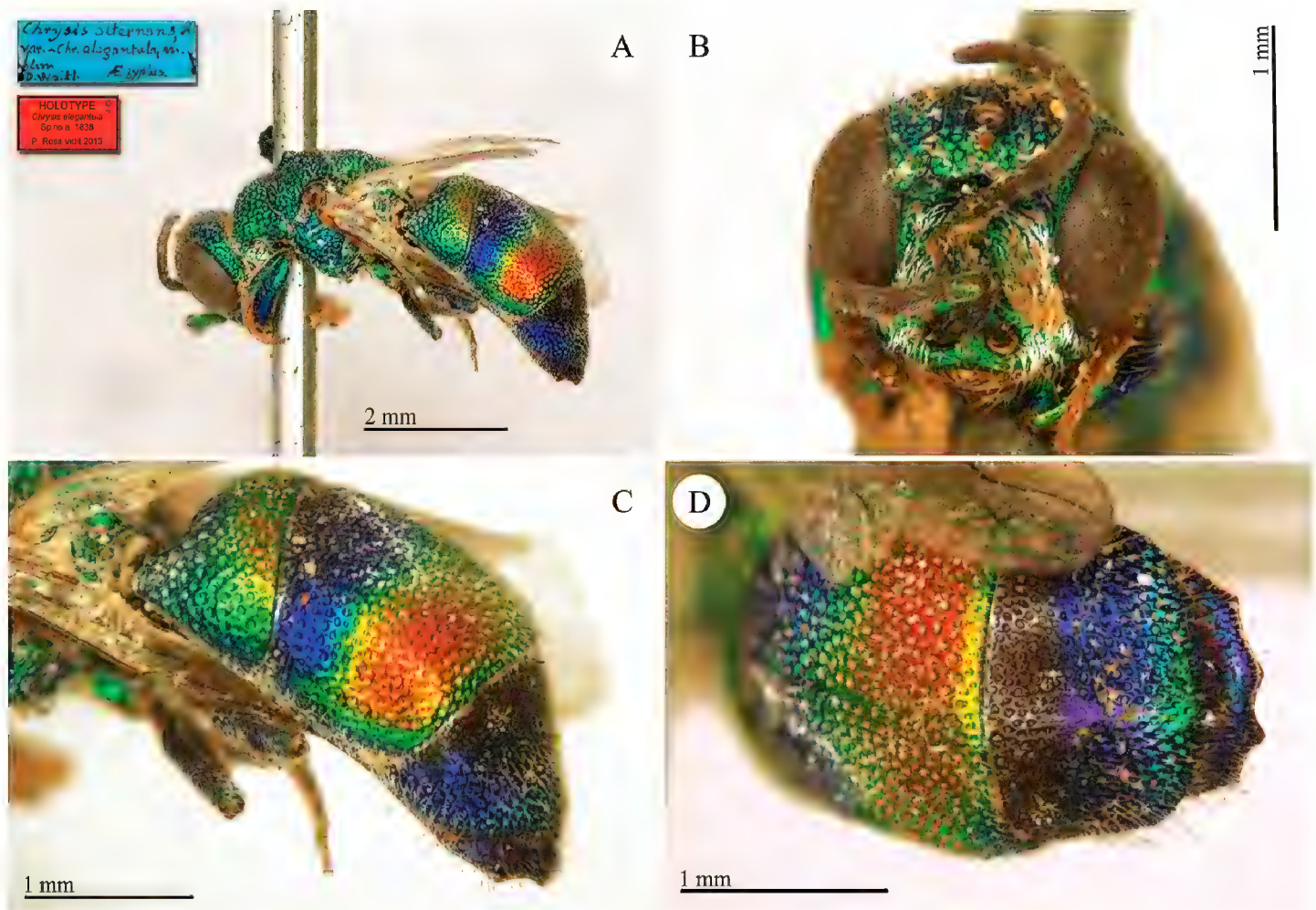
Plate 12

*Chrysis elegantula*: Spinola 1838: 451.**Type locality.** Egypt.**Material. Holotype** ♀. *Chrysis alternans* Kl. // var. - *Chr. elegantula*, n. // olim // D. Walth, Egypt.**Catalogue Casolari & Casolari Moreno.** *Chrysis alternans*, 132, 23, 95, 1 (box 51).**Remarks.** In Casolari and Casolari Moreno (1980: 79) under the name *Chrysis alternans*, the specimen is surely the type of *C. elegantula*. Dahlbom (1854: 236) reported exactly the same names: "*Chrysis alternans* var. c ♂ - *Chrysis elegantula* Mus. Spinola". The type is a female and not a male. It belongs to the *comparata-scutellaris* group.**Current status.** *Chrysis elegantula* Spinola, 1838.***Chrysis emarginatula* Spinola, 1808**

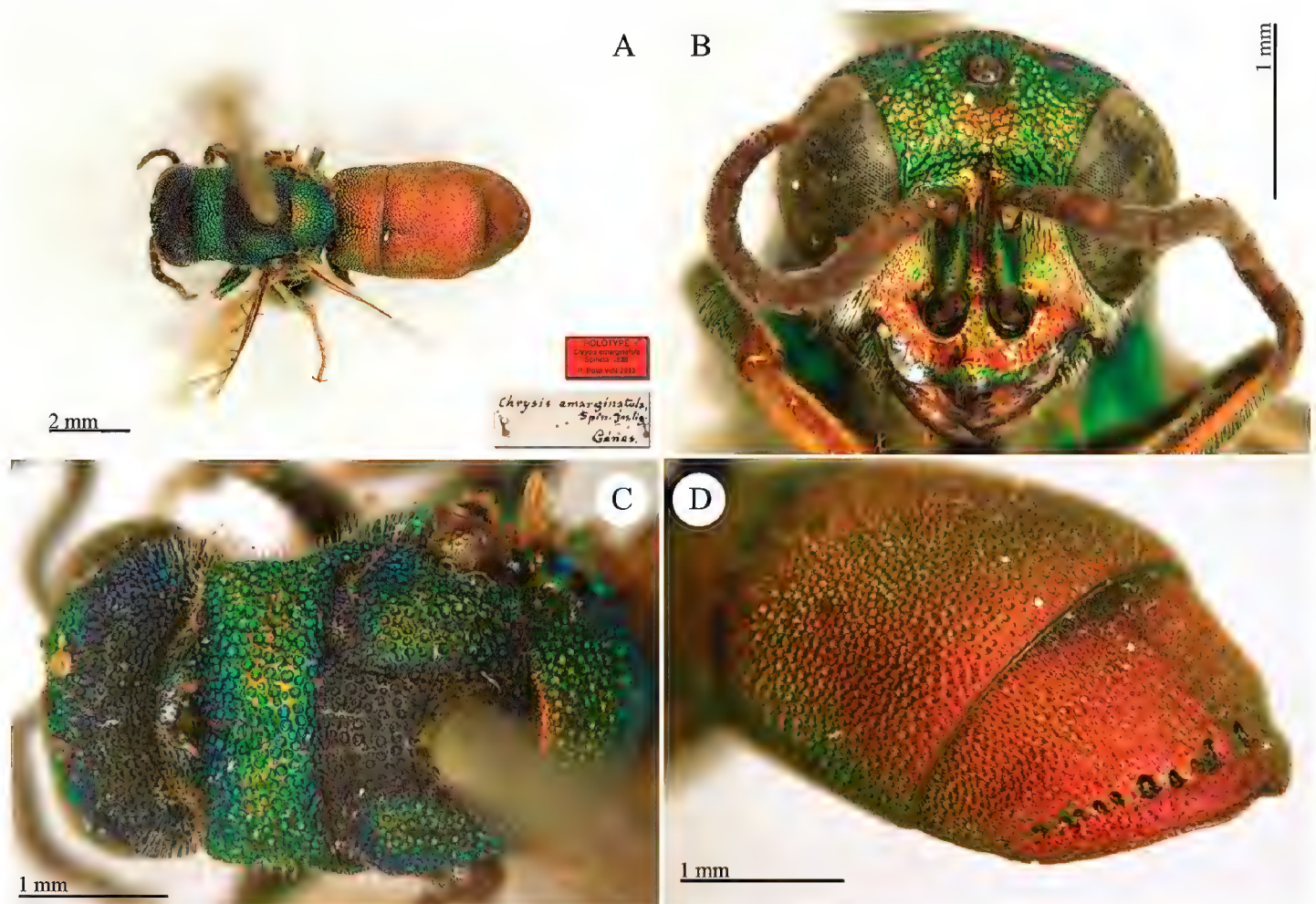
Plate 13

*Chrysis emarginatula*: Spinola 1808: 239.**Type locality.** "Habitat prope Novas [Novara], rarissima".**Material. Holotype** ♂. *Chrysis emarginatula* / Spin. Ins. Lig. / Génes [= Genoa].**Catalogue Casolari & Casolari Moreno.** *Chrysis emarginatula*, 1, 110, 0, 1 (box 50).**Remarks.** The type locality in the description does not match the locality written on the label. At Spinola's time Novara was under the dominion of Genoa, and this is the reason for the different localities. There are no known records of *C. emarginatula* around Genoa. It belongs to the *C. elegans* group.**Current status.** *Chrysis emarginatula* Spinola, 1808.***Chrysis episcopalis* Spinola, 1838***Chrysis episcopalis*: Spinola 1838: 449 *nec* Bloch, 1799.**Type locality.** Egypt.**Material. Lectotype** (here designated) ♀. *Chrysis episcopalis*, Spin.; D. Walth, Égypte.**Paralectotype** 1 ♀. *idem*.**Catalogue Casolari & Casolari Moreno.** *Chrysis episcopalis*, 1, 23, 95, 2 (box 51).**Remarks.** We designate a lectotype of *C. episcopalis* Spinola using one of two syntypes, the one less severely damaged. The second available syntype is badly damaged, with its metasoma glued on the mesosoma. The name *C. episcopalis* Spinola was used as a valid name until recently, when Kimsey and Bohart (1991: 469) observed that it





**Plate 12.** *Chrysis elegantula* Spinola, holotype. **A** Habitus, lateral view **B** head, frontal view **C** metasoma, lateral view **D** second and third metasomal tergites, dorsal view.



**Plate 13.** *Chrysis emarginatula* Spinola, holotype. **A** Habitus, dorsal view **B** head, frontal view **C** head and mesosoma, dorsal view **D** second and third metasomal tergites, dorso-lateral view.



was a junior homonym of *C. episcopalis* Block, 1799. They suggested to use the name *C. syriaca* Guérin, 1842. However, *C. episcopalis* Block is no longer congeneric with *Chrysis* and no author has used the name *episcopalis* Block after the year 1899. Therefore, according to Article 23.9.5 of the Code, the name *C. episcopalis* Spinola is a valid and available name in the genus *Chrysis*. It belongs to the *C. viridissima* group.

**Current status.** *Chrysis syriaca* Guérin, 1842 (synonymised by Kimsey and Bohart 1991: 469).

### *Chrysis exsulans* Dahlbom, 1854

Plate 14

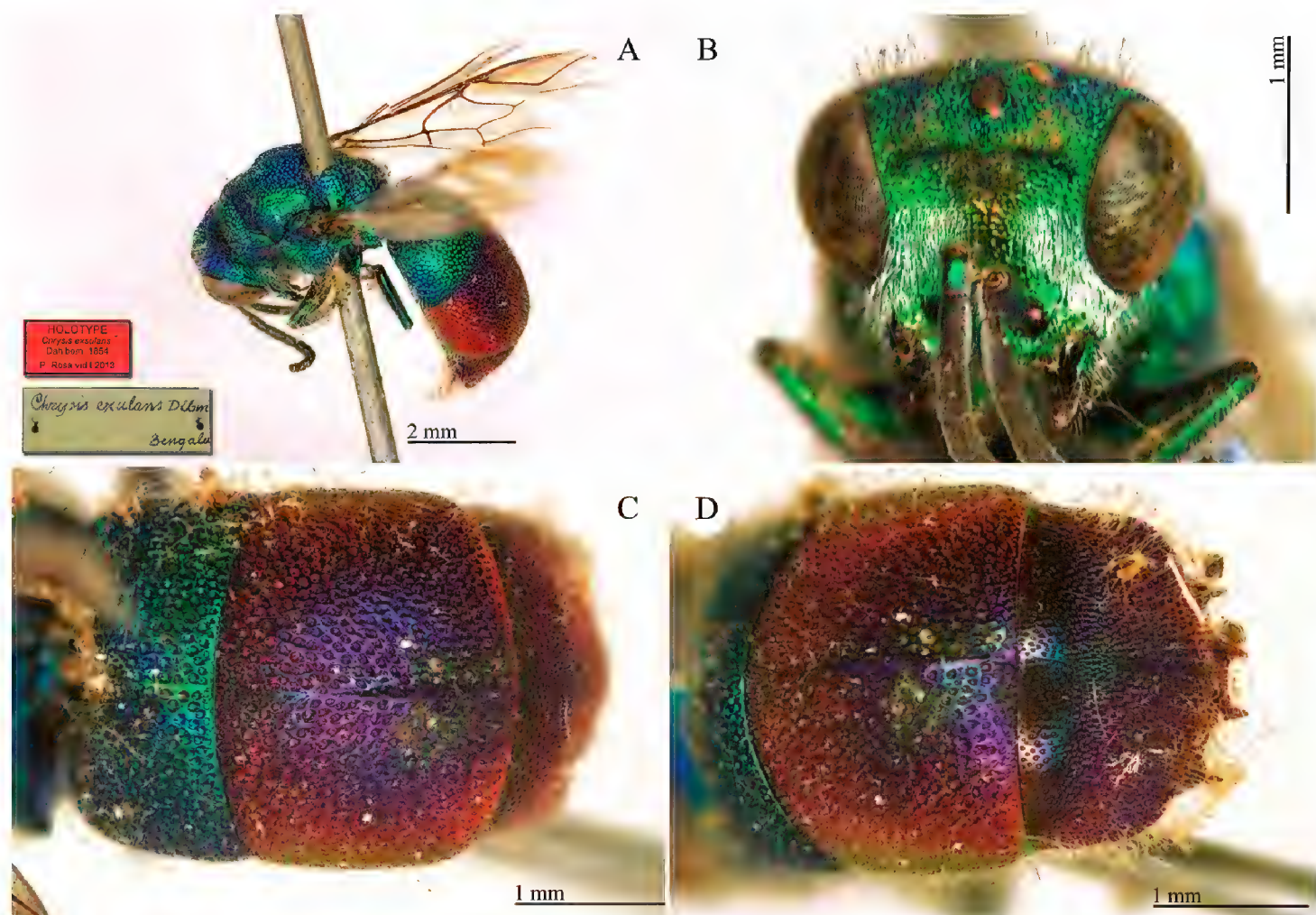
*Chrysis exsulans*: Dahlbom 1854: 247.

**Type locality.** "Patria ignota, forte Bengalia; specimen unicum ut. "Chr. fulgidae varietas" amice communicavit D. Spinola".

**Material.** Holotype ♂. *Chrysis exsulans*, Dlbm. // Bengala.

**Catalogue Casolari & Casolari Moreno.** *Chrysis exsulans*, 27, 42, 0, 1 (box 51).

**Remarks.** Dahlbom realized that this specimen does not have an "exotic" habitus (Bengala was the old name of a district between NW India and Bangladesh) and



**Plate 14.** *Chrysis exsulans* Dahlbom, holotype. **A** Habitus, dorso-lateral view **B** head, frontal view **C** first and second metasomal tergites, dorsal view **D** second and third metasomal tergites, dorsal view.



cited the type locality as "forte Bengalia" [accidentally Bengalia for Bengala]. The species is distributed in North Africa and Near East (Linsenmaier 1999: 218). The type is missing the ventral surface of the metasoma, due to a dermestid attack. It belongs to the *C. ignita* group.

**Current status.** *Chrysis exsulans* Dahlbom, 1854.

### ***Chrysis fasciata* Spinola, 1840**

*Chrysis fasciata*: Spinola 1840: 202 *nec* Olivier, 1790.

**Type locality.** Cayenne (French Guyana).

**Material. Holotype** ♂ (?): *Chrysis distinctissima* Dlbm. - *Chr. fasciata*, m.[ihi] D. Buquet, Cayenna // **Holotype** ♂. *Chrysis intricans* Spinola, R. M. Bohart det. // **Lectotype** ♂. *Chrysis distinctissima* Dahlbom, R.M. Bohart det.

**Catalogue Casolari & Casolari Moreno.** *Chrysis distinctissima*, 27, 56, 1, 2 (box 51).

**Remarks.** See the remarks under *Chrysis distinctissima* Dahlbom, 1854. It belongs to the *C. intricans* group.

**Current status.** *Chrysis intricans* Spinola, 1840.

### ***Chrysis gayi* Spinola, 1851**

Plate 15

*Chrysis gayi*: Spinola 1851: 406.

**Type locality.** Chile.

**Material. Holotype** ♀. *Chrysis Gayi*, Spin. // M. Gay // Chili.

**Catalogue Casolari & Casolari Moreno.** *Chrysis gayi*, 1, 52, 32, 1 (box 51).

**Remarks.** It belongs to the *C. gibba* group.

**Current status.** *Chrysis gibba* Brullé, 1846 (synonymised by Mocsáry 1889: 403).

### ***Chrysis grohmanni* Dahlbom, 1854**

Plate 16

*Chrysis grohmanni*: Dahlbom 1854: 271.

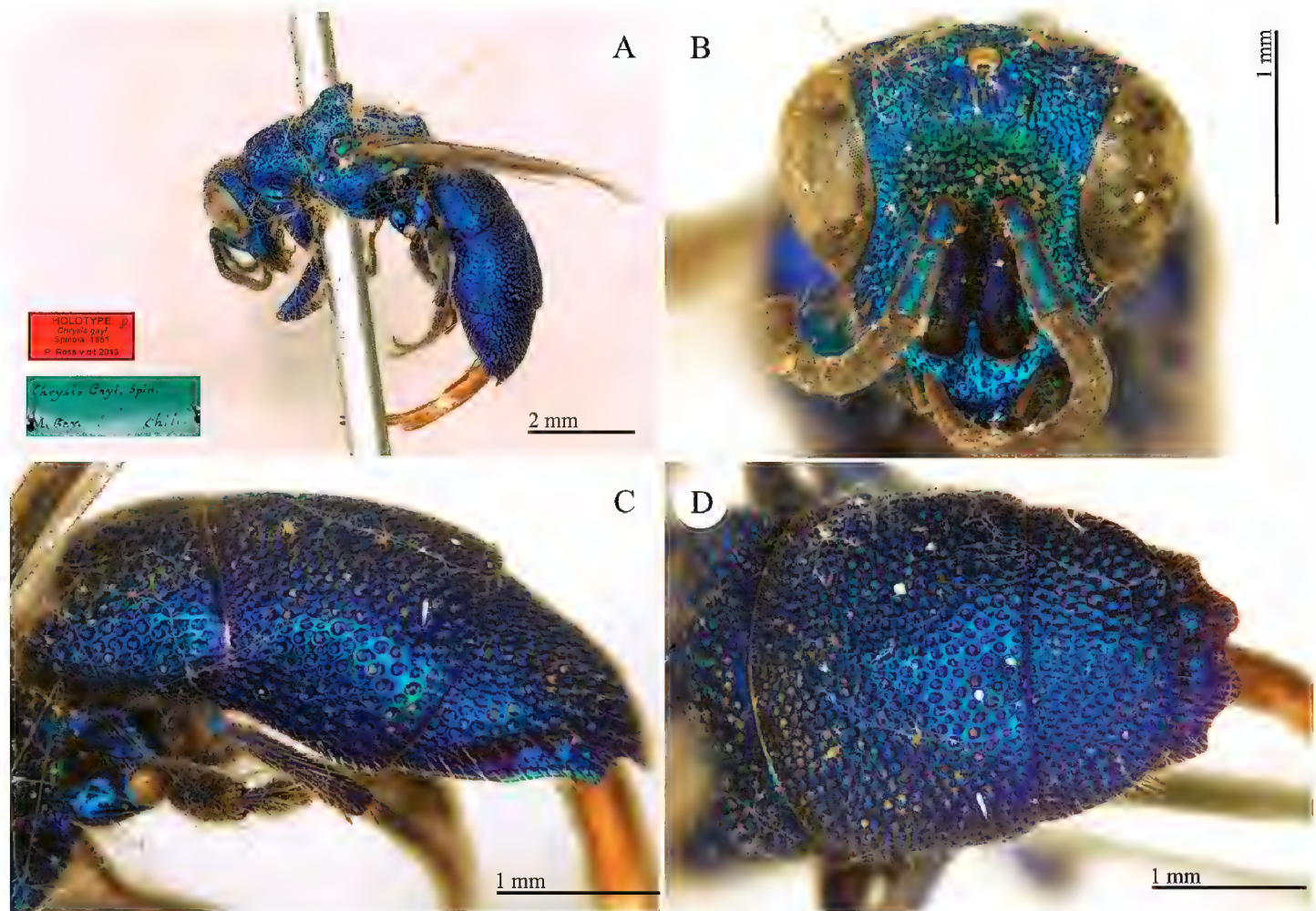
**Type locality.** "Habitat in Sicilia, a D. Grohmann olim detecta, Mus. D. Spinola".

**Material. Lectotype** (here designated) ♀. *Chrysis grohmanni*, n. / D. Grohmann, Sicilia.

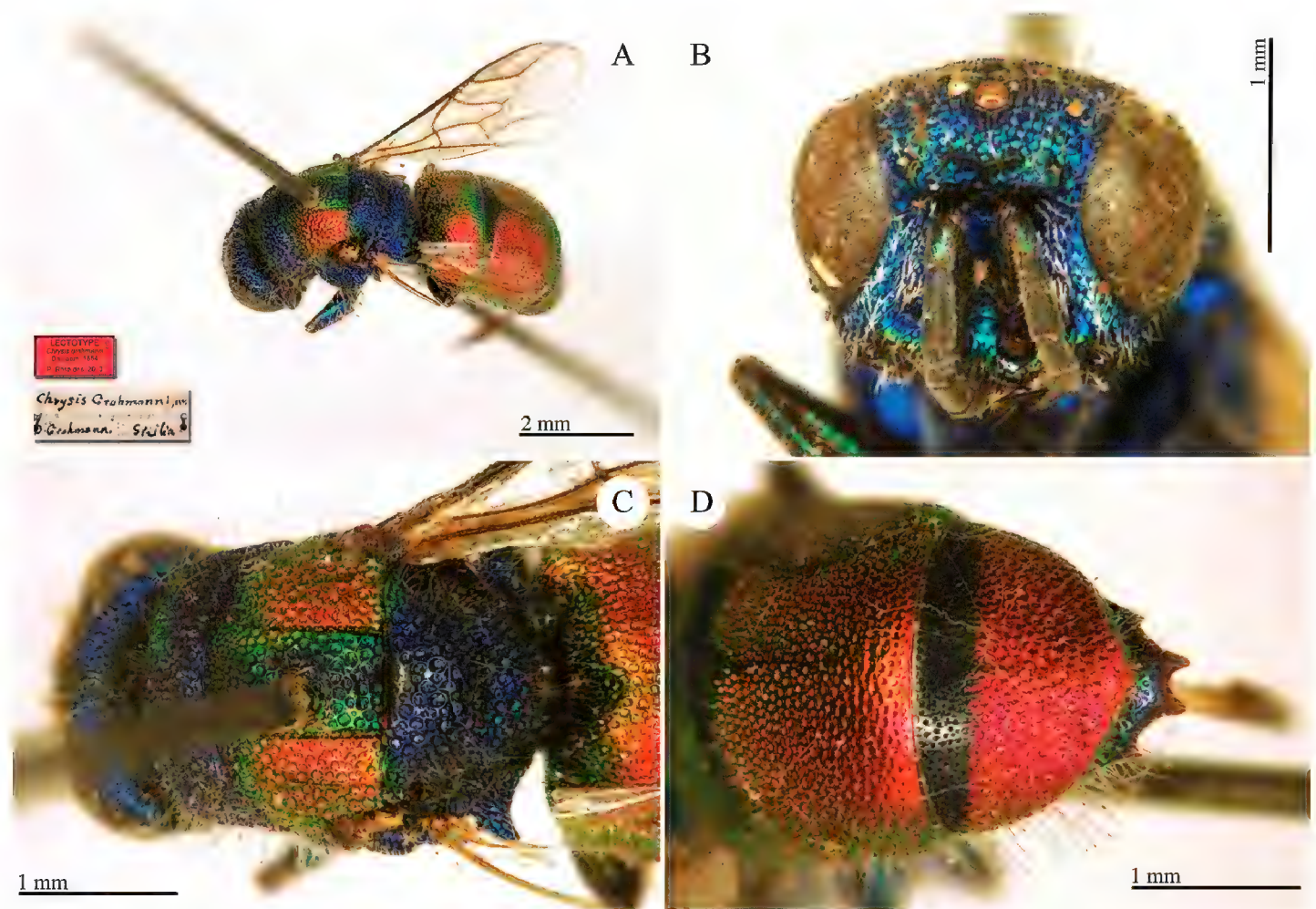
**Catalogue Casolari & Casolari Moreno.** *Chrysis grohmanni*, 1, 204, 34, 3 (box 51).

**Remarks.** Dahlbom (1854) described *C. grohmanni* based on two specimens: one from the Spinola collection, the other from the Paykull collection (= *C. gloriosa* Dahl-





**Plate 15.** *Chrysis gayi* Spinola, holotype. **A** Habitus, lateral view **B** head, frontal view **C** metasoma, lateral view **D** second and third metasomal tergites, dorsal view.



**Plate 16.** *Chrysis grohmanni* Dahlbom, lectotype. **A** Habitus, dorso-lateral view **B** head, frontal view **C** mesosoma, dorsal view **D** second and third metasomal tergites, dorsal view.



bom, 1845). We found three specimens under the name *C. grohmanni* in the Spinola collection, but only one belongs to *C. grohmanni* in its current taxonomic interpretation. The other two specimens are a female of *C. gracillima* Förster, 1853 and a female of *C. bicolor* Lepeletier, 1806, bearing the labels "6288" and "*C. bicolor* Lepel. 127", respectively.

Since there are different species in the series, we designate a lectotype of *C. grohmanni* using the only female matching the original description of the species. The specimen is missing the last seven flagellomeres of the left antenna, and the right wings is glued to the metasoma. It belongs to the *C. succincta* group.

**Current status.** *Chrysis grohmanni* Dahlbom, 1854.

### ***Chrysis incrassata* Spinola, 1838**

Plate 17

*Chrysis incrassata*: Spinola 1838: 454.

**Type locality.** Corse. "Cette espèce nous a été rapportée de la Corse par M. le docteur Chiesi, de Pise".

**Material. Lectotype** (here designated) ♀. *Chrysis incrassata*, Spin.; D. Chiesi, Corse.

**Paralectotype** 1 ♀. idem.

**Catalogue Casolari & Casolari Moreno.** *Chrysis incrassata*, 1, 51, 12, 2 (box 50).

**Remarks.** Spinola (1838) did not write how many specimens the type series consisted of. In the Spinola collection, there are two specimens prepared in the same way under one locality written on the main label. These two specimens likely represent syntypes. One of the syntypes is badly damaged by a dermestid attack. We designate a lectotype of *C. incrassata* Spinola using the less damaged of the above two specimens. The lectotype lacks the last flagellomeres of the right antenna and the last tarsi of the right hind leg. The type locality is Corsica and not Egypt, even though *C. incrassata* was described by Spinola in the paper on Egyptian Hymenoptera.

**Current status.** *Pseudospinolia incrassata* (Spinola, 1838) (transferred by Kimsey and Bohart 1991: 547).

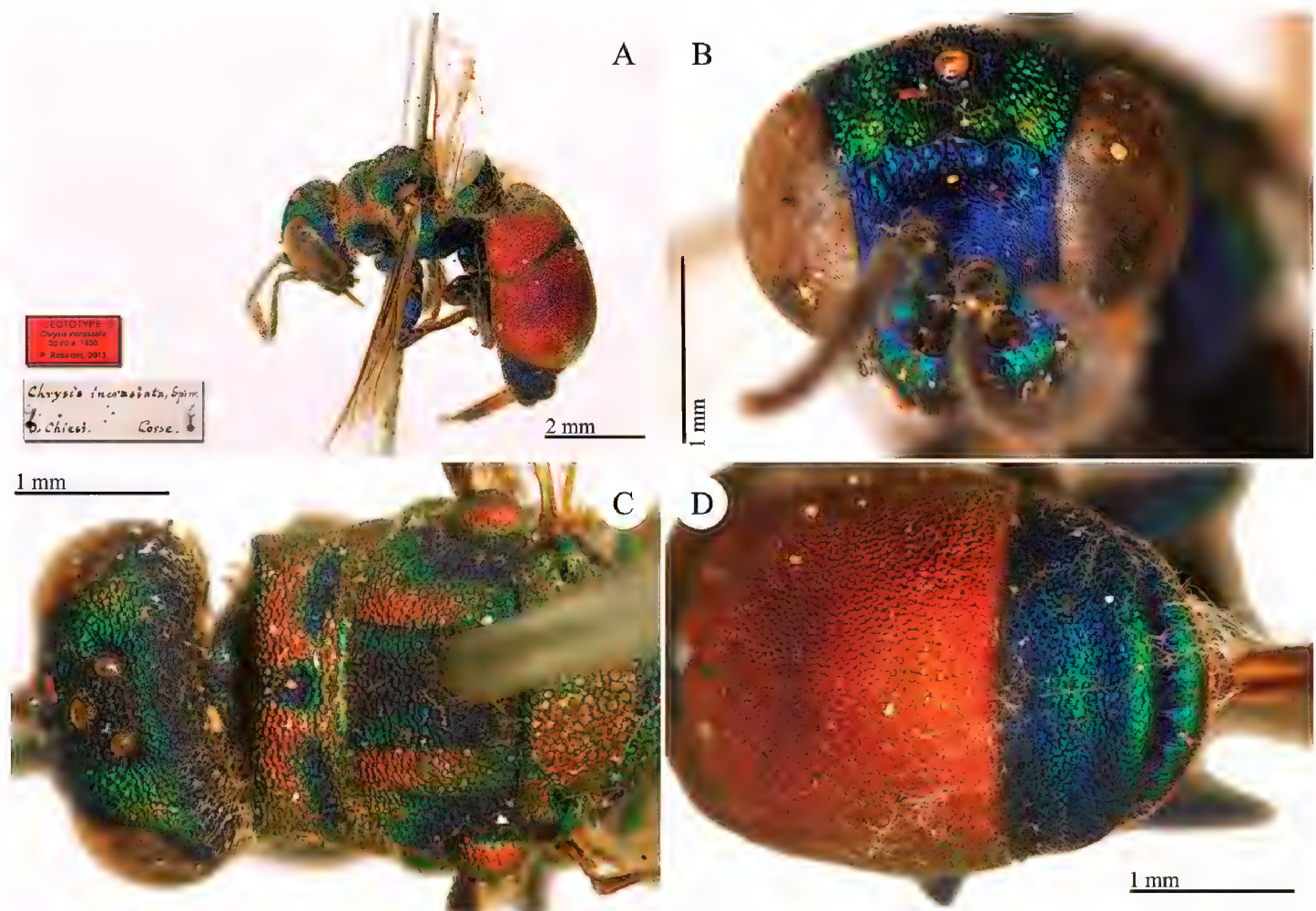
### ***Chrysis intricans* Spinola, 1840**

*Chrysis intricans*: Spinola 1840: 203.

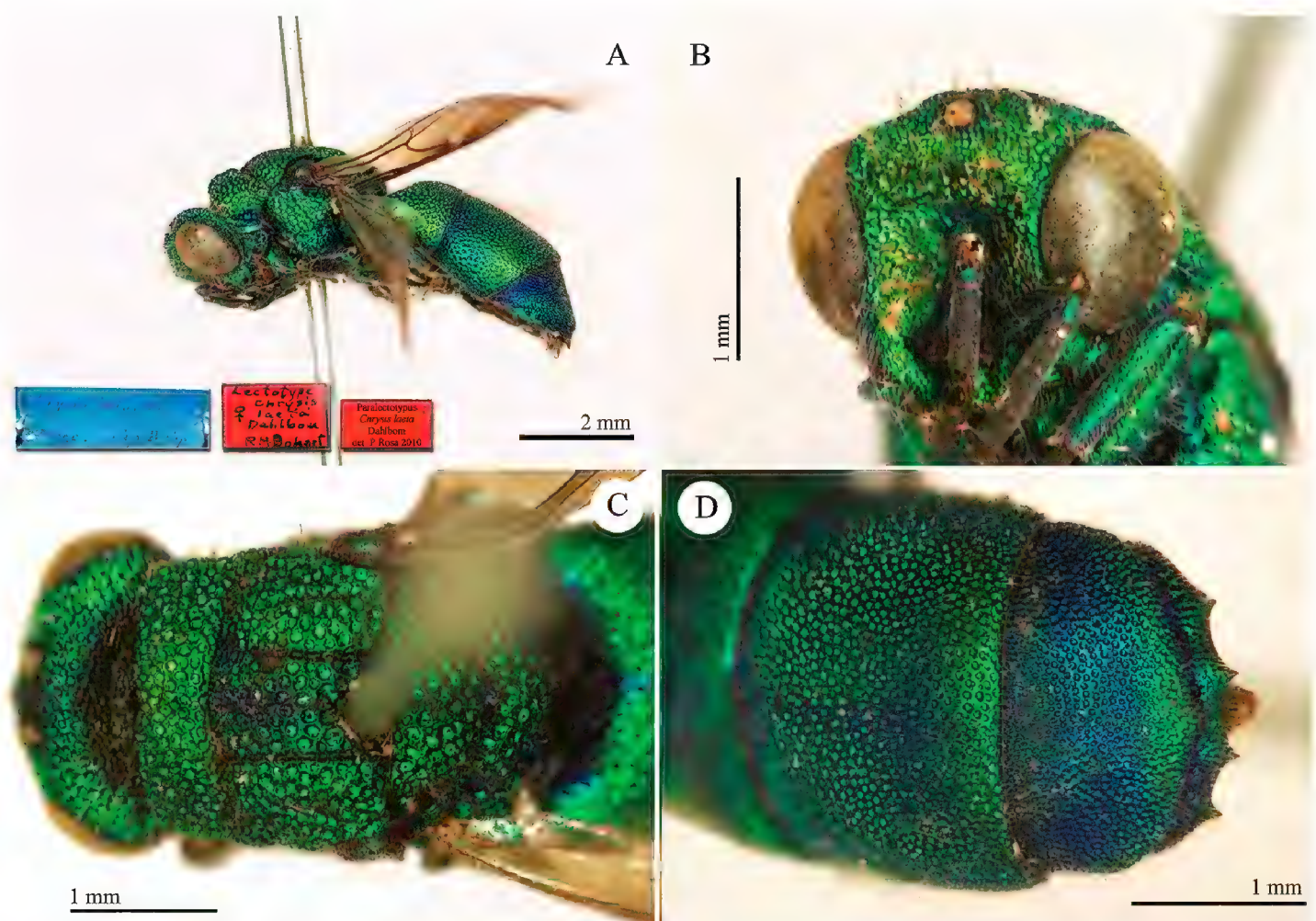
**Type locality.** unknown.

**Material. Holotype** ♂. *Chrysis distinctissima* / Dlbm. - *Chr. fasciata*, m. / D. Buquet, Cayenna // **Holotype** ♂. *Chrysis intricans* Spinola, R. M. Bohart det. // **Lectotype** ♂. *Chrysis distinctissima* Dahlbom, R.M. Bohart det.





**Plate 17.** *Chrysis incrassata* Spinola, lectotype. **A** Habitus, lateral view **B** head, frontal view **C** head and mesosoma, dorsal view **D** second and third metasomal tergites, dorsal view.



**Plate 18.** *Chrysis laeta* Dahlbom, paralectotype. **A** Habitus, lateral view **B** head, frontal view **C** mesosoma, dorsal view **D** second and third metasomal tergites, dorsal view.



**Catalogue Casolari & Casolari Moreno.** *Chrysis distinctissima*, 27, 56, 1, 2 (box 51).

**Remarks.** See the remarks under the name *Chrysis distinctissima* Dahlbom, 1854. It belongs to the *C. intricans* group.

**Current status.** *Chrysis intricans* Spinola, 1840.

***Chrysis laeta* Dahlbom, 1854**

Plate 18

*Chrysis laeta*: Dahlbom 1854: 223.

**Type locality.** "Habitat in promontorio bonae spei, D. Draege, Mus. DD. Drewsen et Spinola; in Guinea, D. Westermann".

**Material. Paralectotypes** 1 ♂ and 3 ♀♀. *Chrysis laeta*, Dr.; D. Draege, Cap. B. Esp.

**Catalogue Casolari & Casolari Moreno.** *Chrysis laeta*, 45, 53, 21, 4 (box 51).

**Remarks.** Bohart (in Kimsey and Bohart 1991: 430) designated a lectotype using a specimen housed in ZMUC. The interpretation of the species given by Linsenmaier (1999: 177) is not correct, since it belongs to the *C. splendidula-senegalensis* group and not to the *comparata-scutellaris* group.

**Current status.** *Chrysis laeta* Dahlbom, 1854.

***Chrysis malachitica* Dahlbom, 1854**

Plate 19

*Chrysis malachitica*: Dahlbom 1854: 335.

**Type locality.** "Habitat in Africa meridionali, ad promontorium bonae spei a Dom. Draege detecta. Specimina tantum 2 vidi, unum a Dom. Spinola et alterum a Dom. Drewsen communicata".

**Material. Paralectotype** 1 ♀. *Chrysis malachitica*, Dr.; inédite; D. Drage, Cap. B. Esp.

**Catalogue Casolari & Casolari Moreno.** *Chrysis malachitica*, 45, 53, 21, 1 (box 51).

**Remarks.** Bohart (in Kimsey and Bohart 1991: 435) designated a lectotype at ZMUC. It belongs to the *C. smaragdula* group.

**Current status.** *Chrysis malachitica* Dahlbom, 1854.

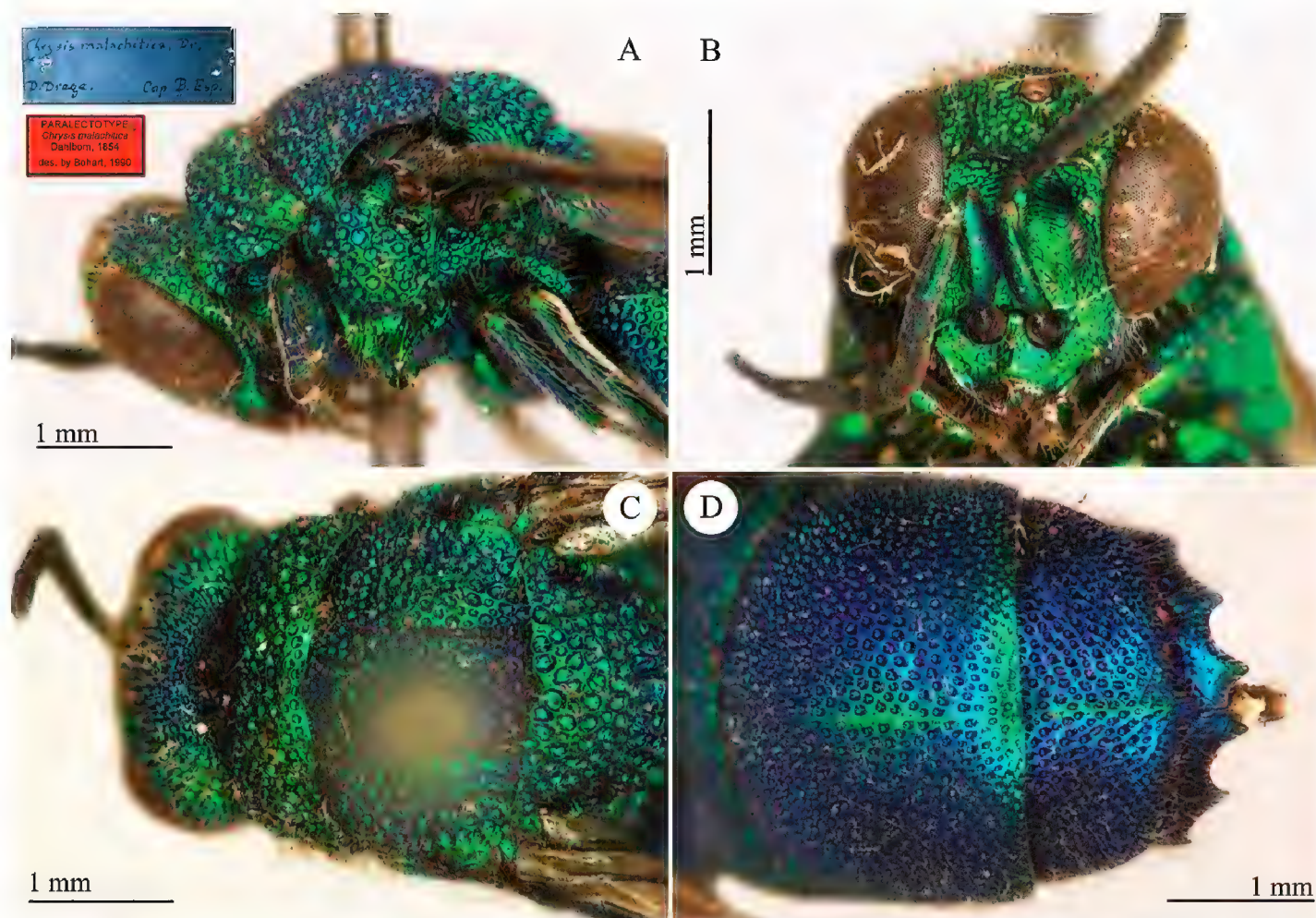
***Chrysis megerlei* Dahlbom, 1854**

Plate 20

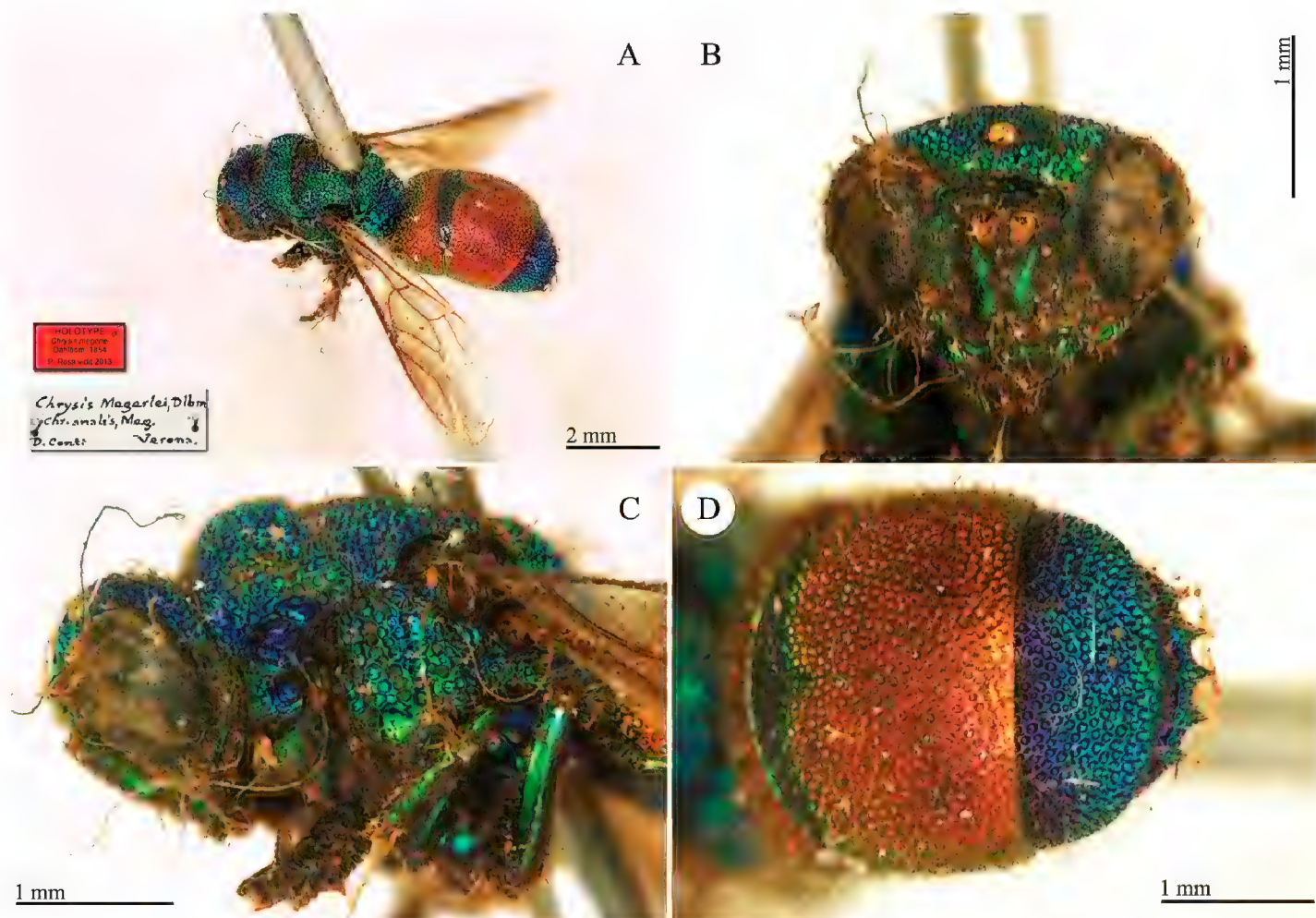
*Chrysis megerlei*: Dahlbom 1854: 297.

**Type locality.** "Habitat ad Veronam, a D. Conti detecta; Mus. Spinolae".





**Plate 19.** *Chrysis malachitica* Dahlbom, paralectotype. **A** Head and mesosoma, lateral view **B** head, frontal view **C** head and mesosoma, lateral view **D** second and third metasomal tergites, dorsal view.



**Plate 20.** *Chrysis megerlei* Dahlbom, holotype. **A** Habitus, dorso-lateral view **B** head, frontal view **C** head and mesosoma, lateral view **D** second and third metasomal tergites, dorsal view.



**Material. Holotype** ♂. *Chrysis megerlei* Dlbm. - *Chr. analis*, Meg.[erle] D. Conti, Verona.

**Catalogue Casolari & Casolari Moreno.** *Chrysis megerlei*, 27, 229, 14, 2 (box 51).

**Current status.** *Praestochrysis megerlei* (Dahlbom, 1854) (transferred by Kimsey and Bohart 1991: 533).

### ***Chrysis modica* Dahlbom, 1854**

*Chrysis modica*: Dahlbom 1854: 326 [nec 1850: 140].

**Type locality.** "Habitat in Africa; 3 specimina vidimus; unum in Guinea lectum, a D. Westermann nobis olim donatum; alterum e promontorio bonae spei a D. Spinola ut variet. Chrysidis malachiticae communicatura; tertium e Port Natal a D. J. Wahlberg reportatum, Mus. R. Acad. Scient. Stockholm".

**Material. Paralectotype** 1 ♀. *Chrysis modica*, Dlbm. D. Dreage, Pr. B. Esp.

**Catalogue Casolari & Casolari Moreno.** *Chrysis modica*, 27, 53, 21, 1 (box 51).

**Remarks.** Dahlbom (1854) described *C. modica* based on three specimens collected in Guinea (ZMUC), Cape of Good Hope (Spinola's collection) and Port Natal (NHRS). Bohart (in Kimsey and Bohart 1991: 437) selected the latter as lectotype. It belongs to the *C. smaragdula* group.

**Current status.** *Chrysis mediocris* Dahlbom, 1845 (synonymised by Kimsey and Bohart 1991: 437).

### ***Chrysis mucronata* Dahlbom, 1854**

Plate 21

*Chrysis mucronata*: Dahlbom 1854: 344 nec Brullé, 1846.

**Type locality.** "Habitat in Africa meridionali, ad promontorium bonae spei a Dom. Draege detecta; unicum specimen nobis communicavit Dom. Spinola".

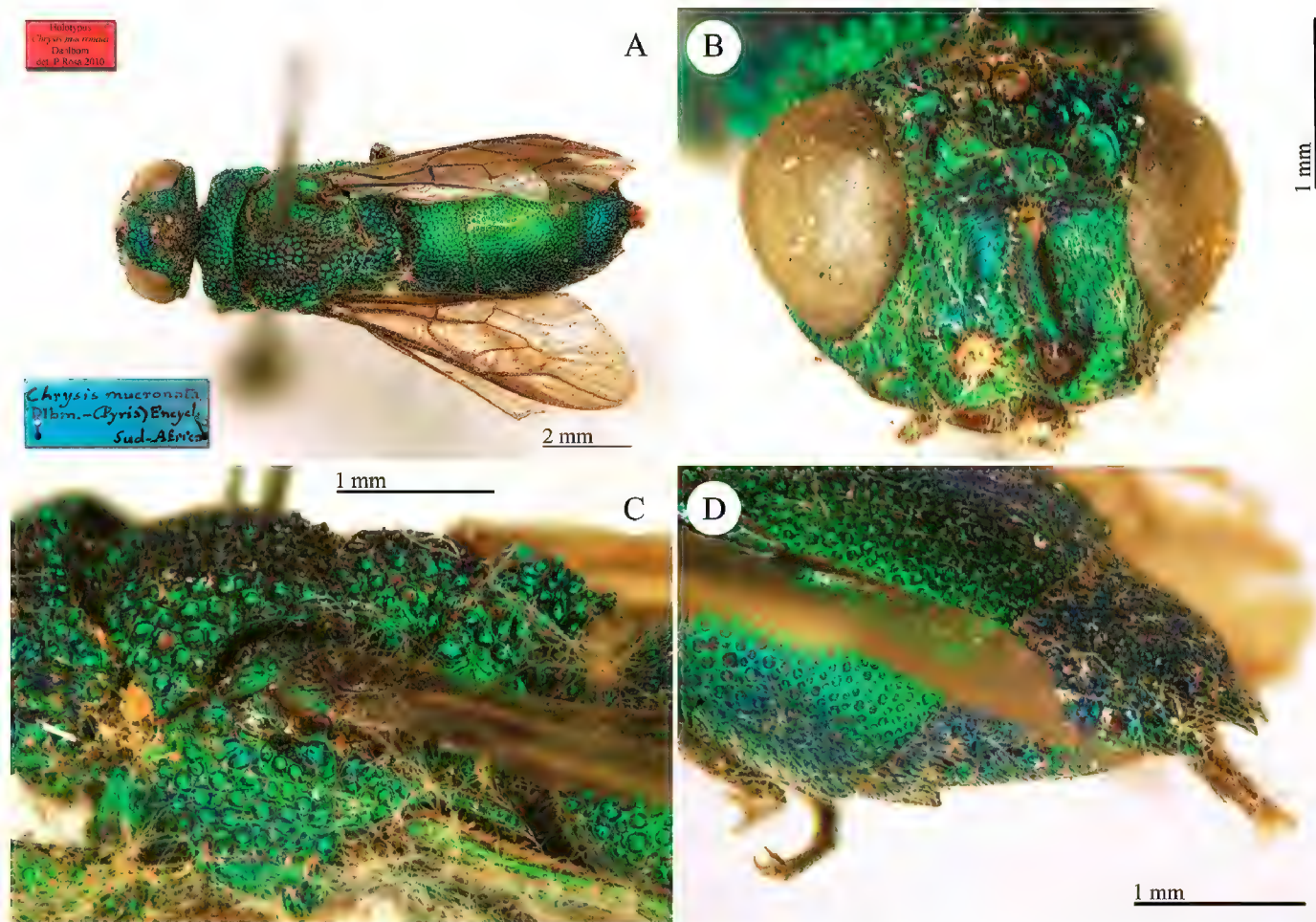
**Material. Holotype** ♀. *Chrysis mucronata* Dlbm – (*Pyria*) Encycl. Sud Africa.

**Catalogue Casolari & Casolari Moreno.** *Chrysis mucronata*, 27, 211, 0, 1 (box 51).

**Remarks.** It is considered as a synonym of *C. laborans* Costa, 1865. The type of *C. laborans* should be housed in Napoli (Museum of the Ferdinando II University), but it is lost. The last author who examined this type was du Buysson (1905). It belongs to the *C. wahlbergi* group.

**Current status.** *Chrysis laborans* Costa, 1865 (synonymised by Kimsey and Bohart 1991: 429).





**Plate 21.** *Chrysis mucronata* Dahlbom, holotype **A** Habitus, dorsal view **B** head, frontal view **C** mesosoma, lateral view **D** second and third metasomal tergites, lateral view.

### *Chrysis pallidicornis* Spinola, 1838

Plate 22

*Chrysis pallidicornis*: Spinola 1838: 451.

**Type locality.** Egypt.

**Material. Lectotype** (here designated) ♀. *Chrysis pallidicornis* m. N. sp., Egitto / 204.

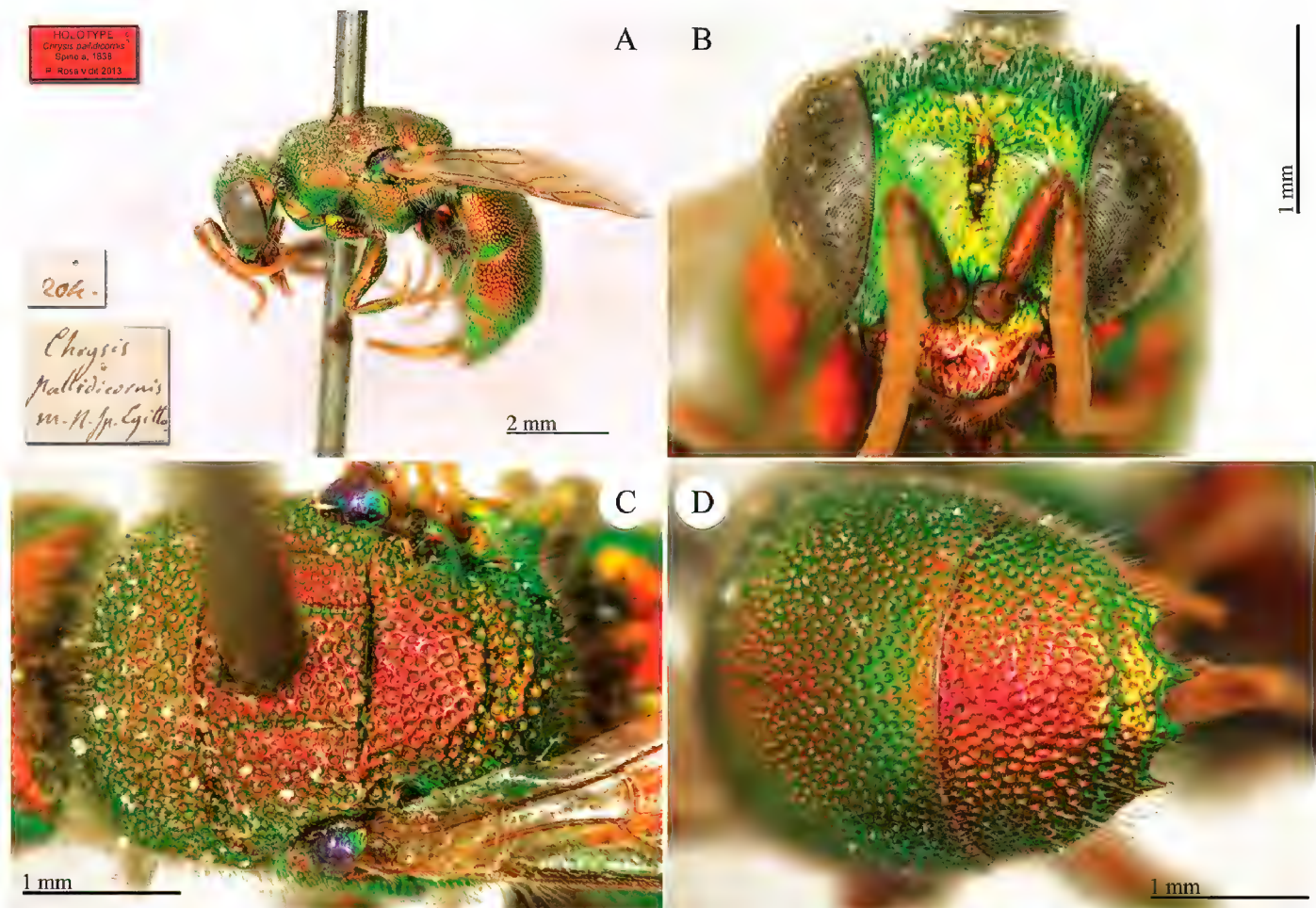
**Paralectotype** 1 ♂, no labels.

**Catalogue Casolari & Casolari Moreno.** *Chrysis pallidicornis*, 1, 23, 0, 2 (box 51).

**Remarks.** There are two specimens under this name in the Spinola collection: one male and one female. However, they do not exhibit the typical large label at the base of the specimen series. Only the female bears two labels: [204] and [*Chrysis pallidicornis* m. [mihi] n. sp., Egitto] handwritten by Spinola. Linsenmaier (1959) examined both types. Since it is not mentioned in the original description how many specimens the author examined, Linsenmaier considered both as syntypes. We designate the specimen bearing Spinola's handwritten labels as lectotype to ensure a correct future identification in this species, which belong to a species-rich and taxonomically currently complicated species group (Zimmermann 1959). The selected specimen matches Linsenmaier's interpretation of the species (Linsenmaier 1959). On Plate 22, the type label is erroneously given as holotype instead of lectotype. It belongs to the *C. pallidicornis* group.

**Current status.** *Chrysis pallidicornis* Spinola, 1838.





**Plate 22.** *Chrysis pallidicornis* Spinola, lectotype **A** Habitus, lateral view **B** head, frontal view **C** mesosoma, dorsal view **D** second and third metasomal tergites, dorsal view.

### *Chrysis palliditarsis* Spinola, 1838

Plate 23

*Chrysis palliditarsis*: Spinola 1838: 449.

**Type locality.** Egypt.

**Material. Holotype** ♂. *Chrysis palliditarsis*, Spin.; ... *fasciolata*, Klug?; D. Walth, Égypte.

**Catalogue Casolari & Casolari Moreno.** *Chrysis palliditarsis*, 1, 23, 95, 1 (box 51).

**Remarks.** The type is badly damaged, lacking the metasoma. It belongs to the *C. comparata-scutellaris* group.

**Current status.** *Chrysis palliditarsis* Spinola, 1838.

### *Chrysis pulchella* Spinola, 1808

Plate 24

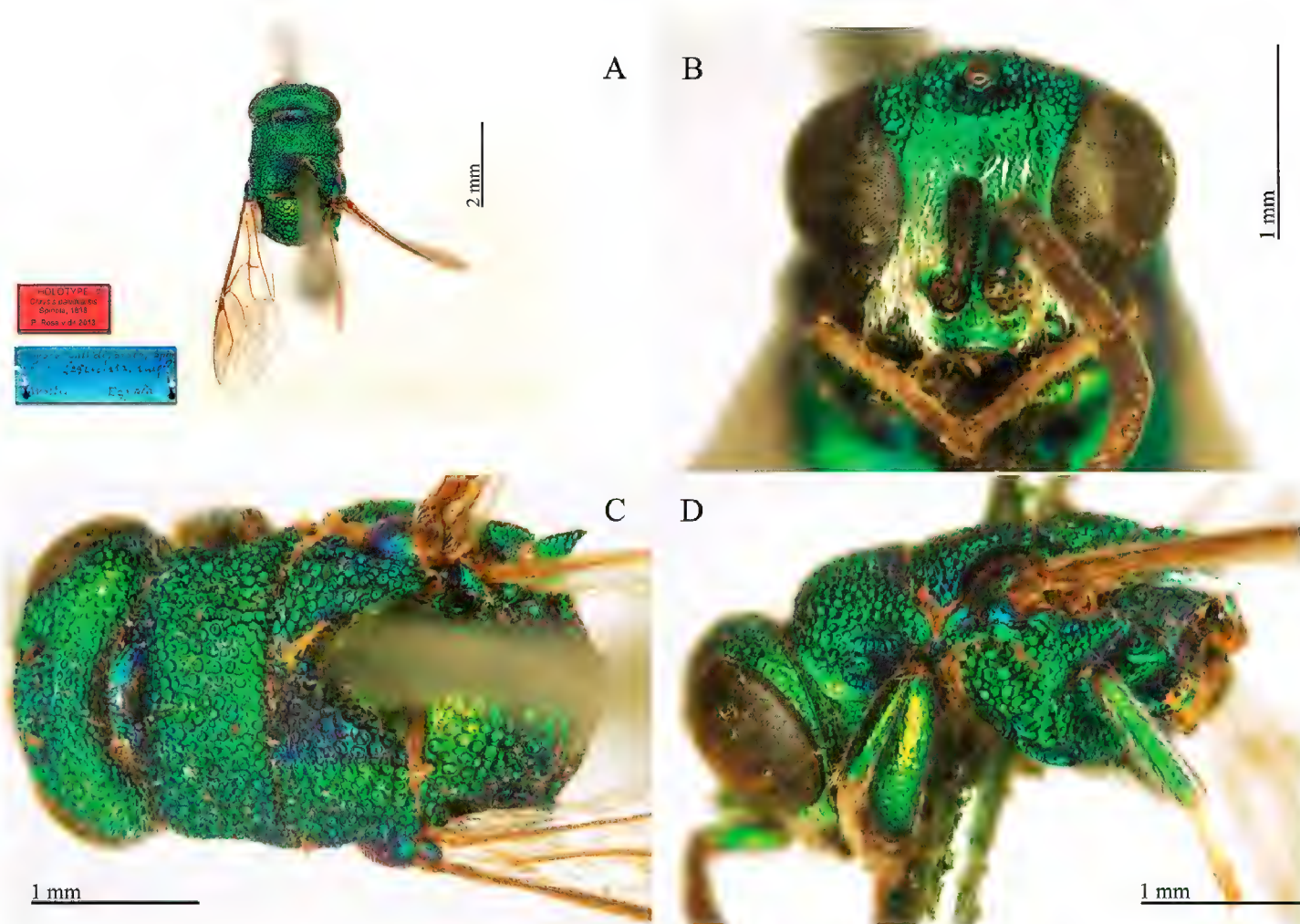
*Chrysis pulchella*: Spinola 1808: 28.

**Type locality.** "Habitat in agro Arquatensi [Arquata Scrivia], rara".

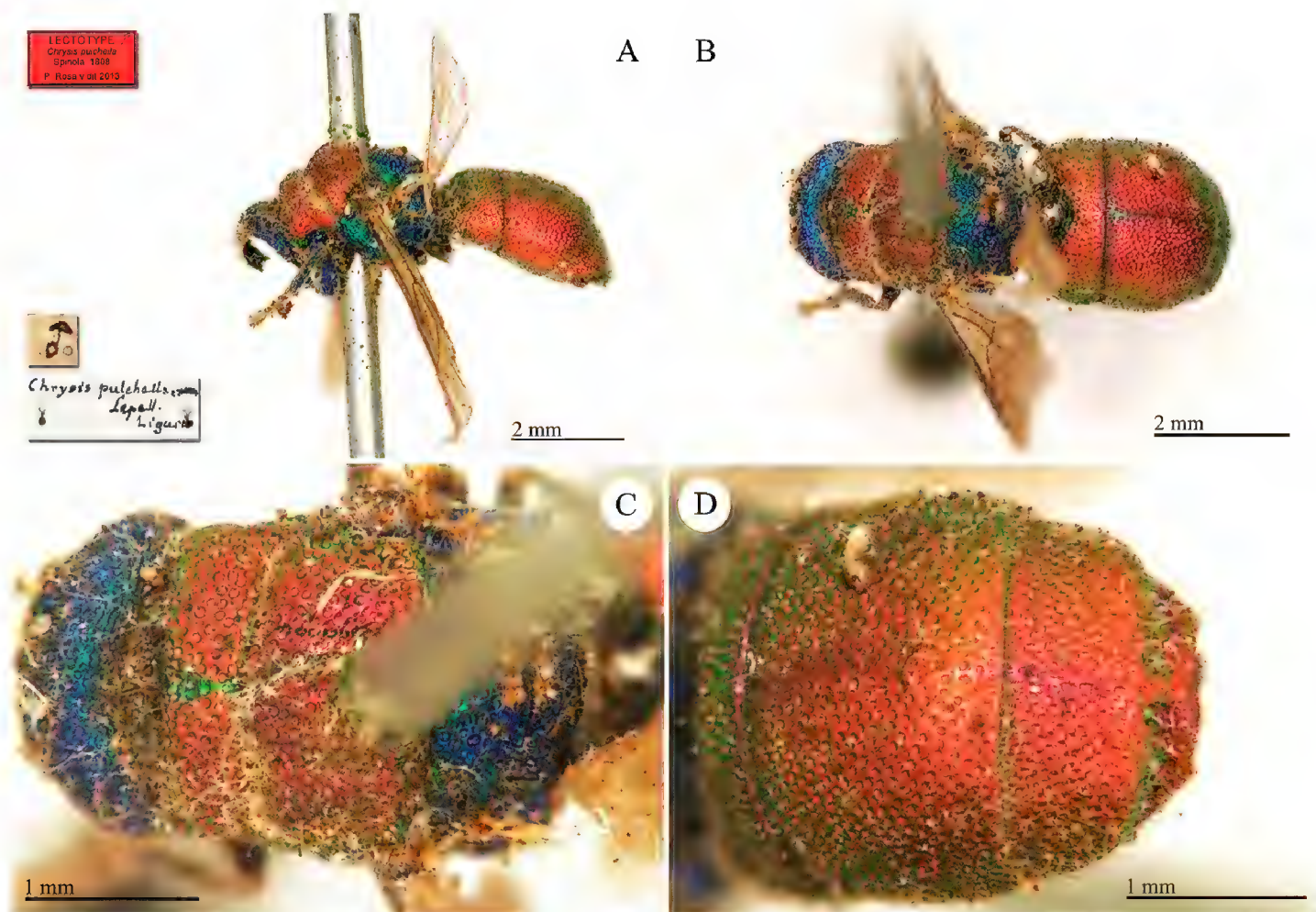
**Material. Lectotype** (here designated) ♂. *Chrysis pulchella* Lepell. Liguria.

**Catalogue Casolari & Casolari Moreno.** *Chrysis pulchella*, 148, 145, 0, 3 (box 51).





**Plate 23.** *Chrysis palliditarsis* Spinola, holotype **A** Head and mesosoma, dorsal view **B** head, frontal view **C** head and mesosoma, dorsal view **D** head and mesosoma, lateral view.



**Plate 24.** *Chrysis pulchella* Spinola, lectotype **A** Habitus, lateral view **B** habitus, dorsal view **C** head and mesosoma, dorsal view **D** second and third metasomal tergites, dorsal view.



**Remarks.** The type series was based on multiple specimens. When Spinola wrote "*rara*" it meant that he examined few specimens; when he wrote "*rarissima*" it meant that he examined only one specimen. At present there are three specimens in the Spinola collection under the name *C. pulchella*: one male, without a metasoma, acquired via the Serville collection; one male of *C. bicolor* Lepeletier, received by a French entomologist and bearing a rounded numerical label (6298); and a male specimen that is referable to the original description of the species and designated here as lectotype. It is unfortunately badly damaged, missing part of its head, all sternites, the internal urites, and some of its legs. It belongs to the *C. pulchella* group.

**Current status.** *Chrysis pulchella* Spinola, 1808.

### *Chrysis punctatissima* Spinola, 1840

Plate 25

*Chrysis punctatissima*: Spinola 1840: 200 *nec* Villers, 1789.

**Type locality.** Cayenne, French Guyana.

**Material. Syntypes** 1♂ and 2♀♀. *Chrysis fasciata* Fab. – *Chr. punctatissima* m.[ihi], olim D. Buquet, Cayenna / *Chrysis carina* ♂ R. M. Bohart det.

**Catalogue Casolari & Casolari Moreno.** *Chrysis punctatissima*, 59, 56, 1, 3 (box 51).

**Remarks.** Dahlbom (1854: 197) treated this species as a synonym of *Chrysis fasciata* Fabricius; for likely this reason, we find written on Spinola's label: "*Chrysis fasciata* Fab - *Chr. punctatissima* mihi".

**Current status.** *Neochrysis carina* (Brullé, 1846) (synonymised by Mocsáry 1889: 339; *N. carina* is the first available name; transferred by Kimsey 1985: 276).

### *Chrysis purpurata* Fabricius, 1787

Plate 26A

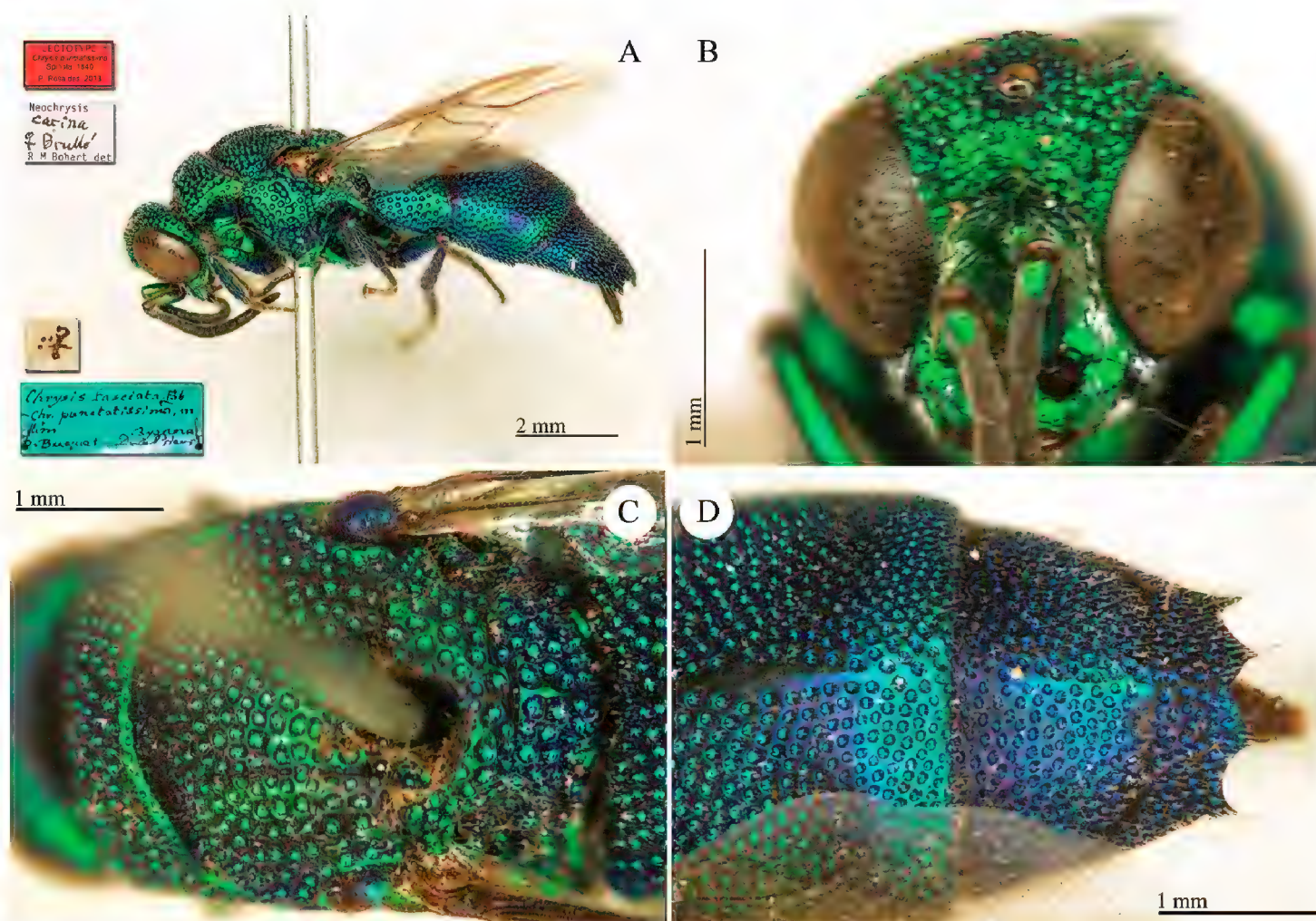
*Chrysis purpurata*: Fabricius 1787. ICZN Opinion 1906: 195.

**Material. Neotype** ♀. *Euchroeus purpureus* Latr.. – *purpuratus*, (*Chr.*) Fab. Coll. Latr., Fr. mérid. // *Chrysis purpurata* F. 1787 **Neotypus** M. Pavesi & F. Strumia det. 1998.

**Catalogue Casolari & Casolari Moreno.** *Euchraeus purpureus*, 149, 99, 51, 4 (box 52).

**Remarks.** Kimsey (1988: 272) designated the lectotype of *C. purpurata* at ZMUC, based on one specimen labelled *C. purpurata* but belonging to another species: *Chrysis iris* Christ, 1791. The consequence was that the generic name *Euchroeus* Latreille, 1809 became a junior synonym of *Chrysis* Linnaeus, 1761 (Pavesi and Strumia 1997) and the generic name *Euchroeus* was replaced by the first available name: *Brugmoia* Radoszkowski, 1877. The species formerly known as *Euchroeus purpuratus* auctorum





**Plate 25.** *Chrysis punctatissima* Spinola, lectotype **A** Habitus, lateral view **B** head, frontal view **C** mesosoma, dorsal view **D** second and third metasomal tergites, dorsal view.

was replaced by the name *Brugmoia quadrata* (Shuckard, 1837). The Commission on the ICZN approved the documentations provided by Pavesi and Strumia (1997) as valid and suppressed the lectotype designated by Kimsey and conserved the generic name *Euchroeus* Latreille and the specific name *purpurata* Fabricius. Pavesi and Strumia (ICZN 1998) designated the neotype of *C. purpurata* in the Spinola collection.

**Current status.** *Euchroeus purpuratus* (Fabricius, 1787) (transferred by Latreille 1809).

### *Chrysis ramburi* Dahlbom, 1854

Plate 27

*Chrysis ramburi*: Dahlbom 1854: 249.

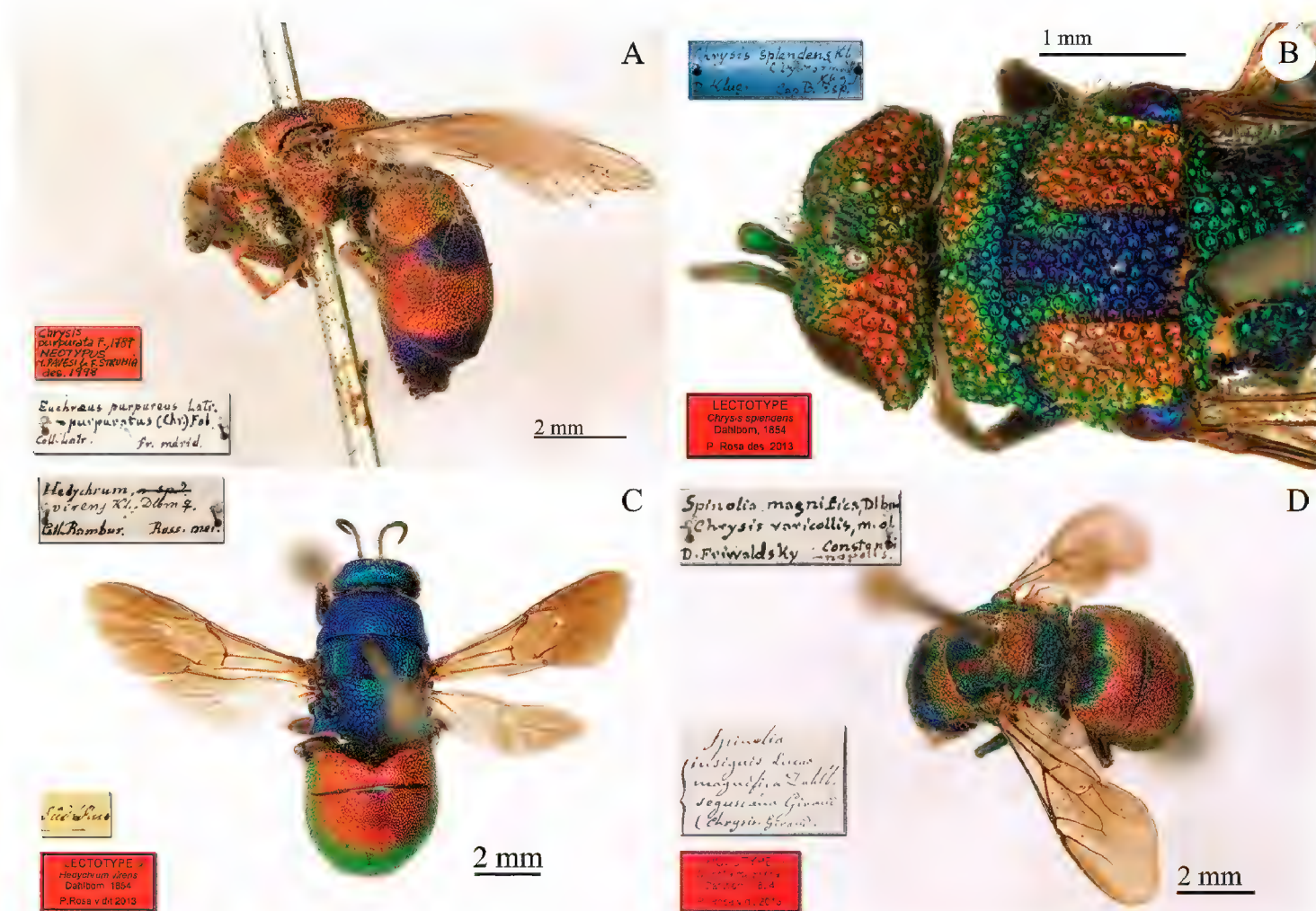
**Type locality.** "Habitat in Europa meridionali rarius; marem unicum in Hispania a D. Rambur detectum et feminam unicum in Lombardia a D. Christophori lectam communicavit D. Spinola".

**Material. Lectotype** (here designated) ♂. *Chrysis Ramburi*, Spin. n. sp.?. D. Rambur, Espagne, Sierra Nevada.

**Paralectotype** ♀. *Chrysis Ramburi*, Spin. n. sp.?. D. Rambur, Espagne, Sierra Nevada.

**Catalogue Casolari & Casolari Moreno.** *Chrysis ramburi*, 1, 101, 74, 2 (box 51).





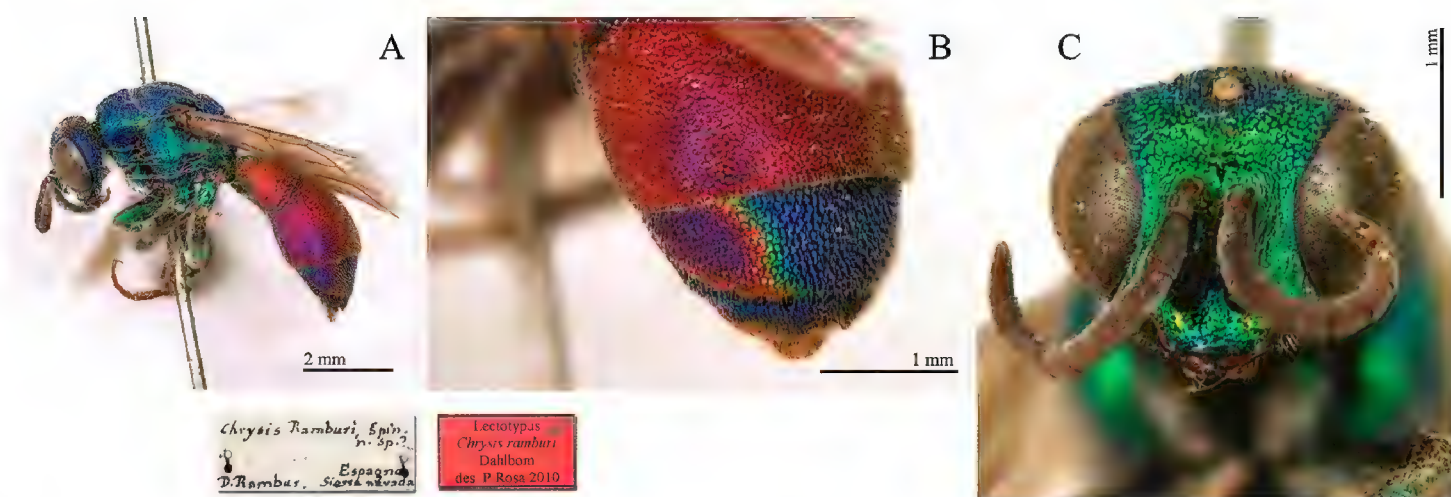
**Plate 26.** **A** *Chrysis purpurata* Fabricius, neotype, habitus, lateral view **B** *Chrysis splendens* Dahlbom, lectotype, head and mesosoma, dorsal view **C** *Hedychrum virens* Dahlbom, lectotype, habitus, dorsal view **D** *Spinolia magnifica* Dahlbom, holotype, habitus, dorsal view.

**Remarks.** The type series includes two specimens: one male from Spain and one female from Lombardy (Italy). Both syntypes are housed in the Spinola collection. They match the original description, but they belong to two different species. The male belongs to *C. ramburi* Dahlbom, whereas the female to *C. chrysostigma* Mocsáry, 1889. Dahlbom (1854) described them as male and female of the same species based on the colour of the last visible tergite. The differences given in the text between the two taxa were supposed to be sexual dimorphic characteristics.

*C. ramburi* in Europe is present only on the Iberian Peninsula and occasionally in south France, whereas it is more frequent in North Africa, particularly in Morocco. *C. chrysostigma*, on the other hand, is widely distributed in southern Europe from France to the Czech Republic, and it is quite common in Italy. The two species were already considered separate taxa by various authors (e.g. Linsenmaier 1987: 151; Tyrner 2007: 48). Kimsey and Bohart (1991: 455) placed *C. chrysostigma* in synonymy of *C. ramburi*. Móczár (1965: 172) designated a lectotype of *C. chrysostigma* at HNHM. We therefore designate a lectotype of *C. ramburi* Dahlbom to fix the current interpretation of the species and to avoid future misidentifications based on the fact that Dahlbom described two different species under one and the same name. The selected lectotype is based on the male specimen with a thin layer of mould. It belongs to the *C. comparata-scutellaris* group.

**Current status.** *Chrysis ramburi* Dahlbom, 1854.





**Plate 27.** *Chrysis ramburi* Dahlbom, lectotype **A** Habitus, lateral view **B** second and third metasomal tergites, dorso-lateral view **C** head, frontal view.

### *Chrysis refulgens* Spinola, 1806

Plate 28

*Chrysis refulgens*: Spinola 1806: 8.

**Type locality.** "Habitat prope Genuam [Genoa], haud infrequens".

**Material. Lectotype** (here designated) ♀. *Chrysis refulgens*, Spin. 36. *scutellata*, Panz. Genes [= Genoa].

**Catalogue Casolari & Casolari Moreno.** *Chrysis refulgens*, 1, 110, 0, 2 (box 50).

**Remarks.** Spinola (1806) described *C. refulgens* based on a number of specimens (*haud infrequens*) collected in Liguria (Genoa). In his collection, there are two specimens collected at Genoa, but only the single one female specimen of these belongs to this species; the male specimen belongs to *C. graelsii* Guérin, 1846, which therefore has to be excluded from the syntype series. To avoid future misinterpretation of the specimens in the Spinola collection, we designate the above female matching the description provided by Spinola as the lectotype of *C. refulgens* Spinola. It is missing the right antenna and the left flagellum. Kimsey and Bohart (1991: 495) cited another type at MNHN. It belongs to the *C. radians* group.

**Current status.** *Chrysura refulgens* (Spinola, 1806) (transferred by Kimsey and Bohart 1991: 495).

### *Chrysis reichei* Dahlbom, 1854

Plate 29

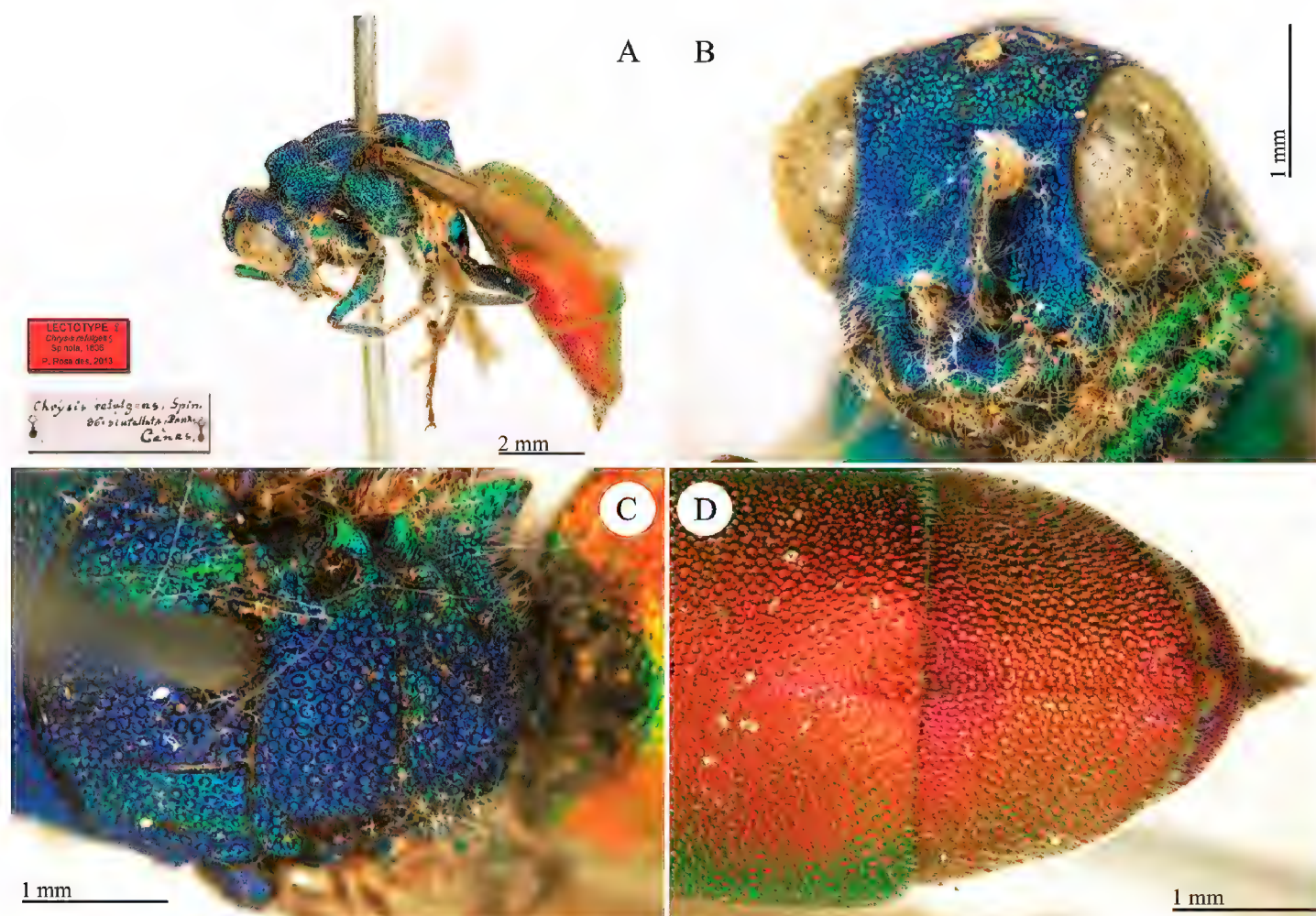
*Chrysis reichei*: Dahlbom 1854: 218.

**Type locality.** "Habitat in Africa meridionali ad Caput bonae spei, Mus. D. Spinolae".

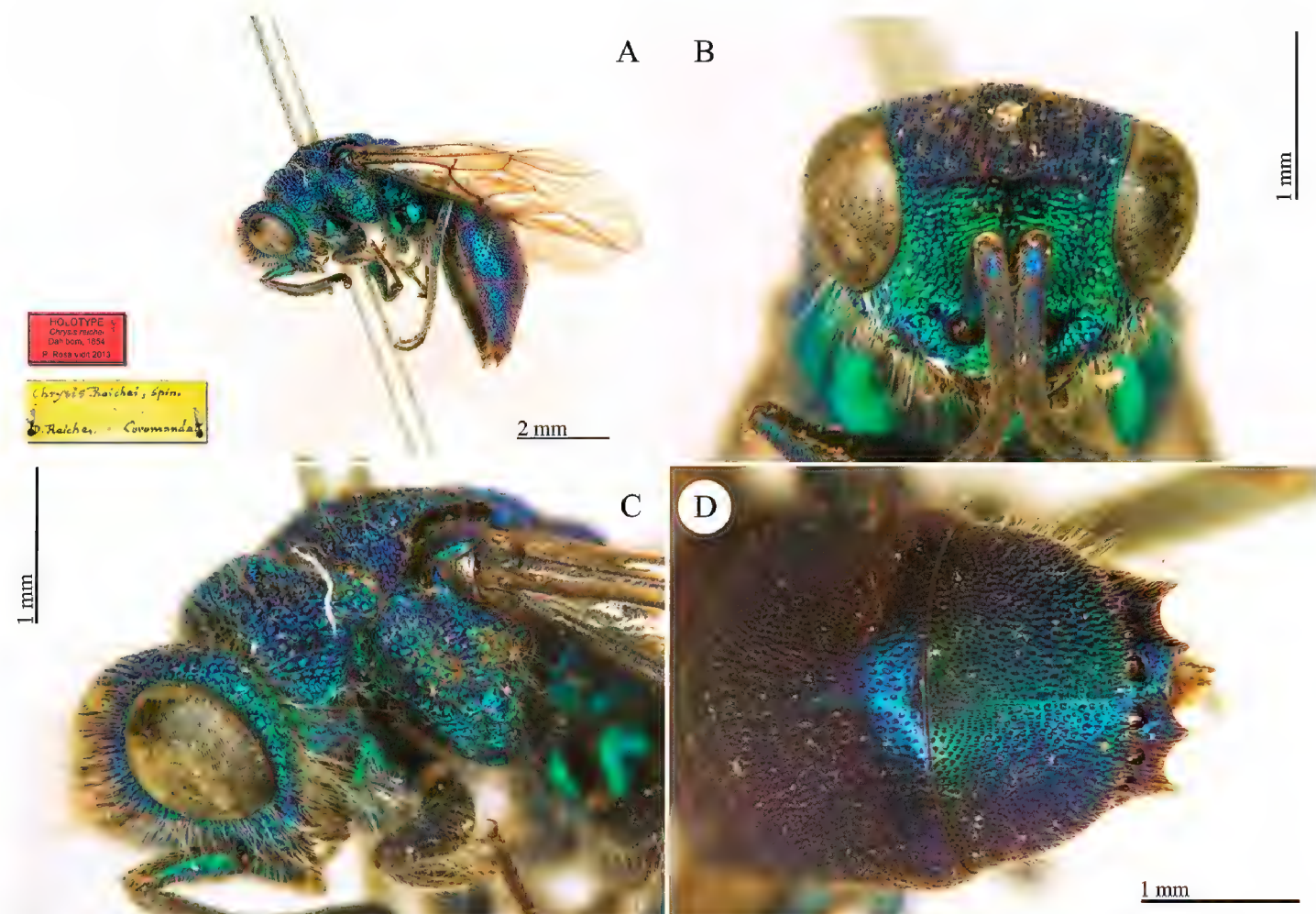
**Material. Holotype** ♀. *Chrysis reichei*, Spin. D. Reiche Coromandal.

**Catalogue Casolari & Casolari Moreno.** *Chrysis reichei*, 1, 55, 75, 1 (box 51).





**Plate 28.** *Chrysis refulgens* Spinola, lectotype **A** Habitus, lateral view **B** head, frontal view **C** mesosoma, dorsal view **D** second and third metasomal tergites, dorsal view.



**Plate 29.** *Chrysis reichei* Dahlbom, holotype **A** Habitus, lateral view **B** head, frontal view **C** head and mesosoma, lateral view **D** second and third metasomal tergites, dorsal view.



**Remarks.** Spinola (1838: 448) described *Pyria reichei* (currently *Chrysis lincea* Fabricius, 1775) based on one specimen collected by Reiche at Cape of Good Hope, in South Africa. Dahlbom (1854: 218) described a new species based on another specimen received from Spinola under the name *C. reichei* and collected at Coromandel in the province of Minas Gerais in Brazil. This species is clearly different from *Pyria reichei* Spinola. Dahlbom (1854) redescribed the species because the specimen received earlier did not match the original description. However, he actually described a new species, confused the type locality Coromandel, Brazil, with Coromandal, which is in South Africa, Mpumalanga State. The holotype of *Pyria reichei* Spinola is currently considered lost. It belongs to the *ignita* group.

**Current status.** *Chrysis brasiliensis* Brullé, 1846 (synonymised by Kimsey and Bohart 1991: 391).

### *Chrysis rutilans* Dahlbom, 1854

*Chrysis rutilans* Dahlbom: 1854: 260 *nec* Olivier, 1790.

**Type locality.** "Habitat in Lusitania, Italia, Gallia, Turcia ad Constantinopol. Feminam, in Tirolia a Cl. Prof. Apex, detectam, in Museo Berolinensi anno 1847 vidi."

**Material. Syntype** 1 ♂. *Chrysis rutilans*, Oliv. Coll. Latr., Fr. mérid.

**Catalogue Casolari & Casolari Moreno.** *Chrysis rutilans*, 199, 99, 51, 1 (box 51).

**Syntype** (sex unknown; 1 ♂ according the description): *Chrysis bicolor*, Dlbm D. Friwaldsky, Graecia.

**Catalogue Casolari & Casolari Moreno.** *Chrysis bicolor*, 27, 109, 30, 1 (box 50).

**Remarks.** In the Spinola collection there are two specimens listed by Dahlbom (1854) under his diagnosis of *C. rutilans*. Dahlbom (1854) gave a description of *C. rutilans* Olivier, assuming that at least one of Spinola's specimens was a type or was compared by Latreille (Dahlbom 1854) with a type: "*Chrysis rutilans* Olivier, teste Latreille olim in litteris ad Spinola" and "*Chrysis Friwaldskyi* Spinola" both specimens housed in "Mus. Spinolae". The same species had been described one year before by Förster (1953) as *C. chrysoprasina*. It belongs to the *C. comparata-scutellaris* group.

**Current status.** *Chrysis chrysoprasina* Förster, 1853 (synonymised by Mocsáry 1887: 16).

### *Chrysis sicula* Dahlbom, 1854

*Chrysis sicula*: Dahlbom 1854: 158 (given as var. *ab* and var. *f*).

**Type locality.** Sicily.

**Material. Holotype** (?) ♀. *Chrysis elegans*, Lepell. et Dlbm. var. *a*, ♀ - *β*. id. var. *ab*. Dlbm. - *Chr. sicula*, mihi olim D. Grohmann. Sicilia.



**Catalogue Casolari & Casolari Moreno.** *Chrysis elegans*, 164, 204, 34, 2 (box 50).

**Remarks.** Dahlbom (1854) referred to three specimens housed in the Spinola collection named *C. sicula*. The male specimen is no longer present in the collection, and it was not listed by Spinola himself, who listed only two female specimens: *C. elegans* var. *a* and " $\beta$ " var. *ab*. However, there is no perfect match between Dahlbom (1854) descriptions and Spinola's label, since the form " $\beta$ " referred to a male (described with green mesosoma), whereas in the Spinola collection the label " $\beta$ " refers to a female. We interpret *Chrysis sicula* as a **new synonym** of *Chrysis elegans* Lepeletier, 1806. It belongs to the *C. elegans* group.

**Current status.** *Chrysis elegans* Lepeletier Lepeletier, 1806.

### *Chrysis singularis* Spinola, 1838

Plate 30

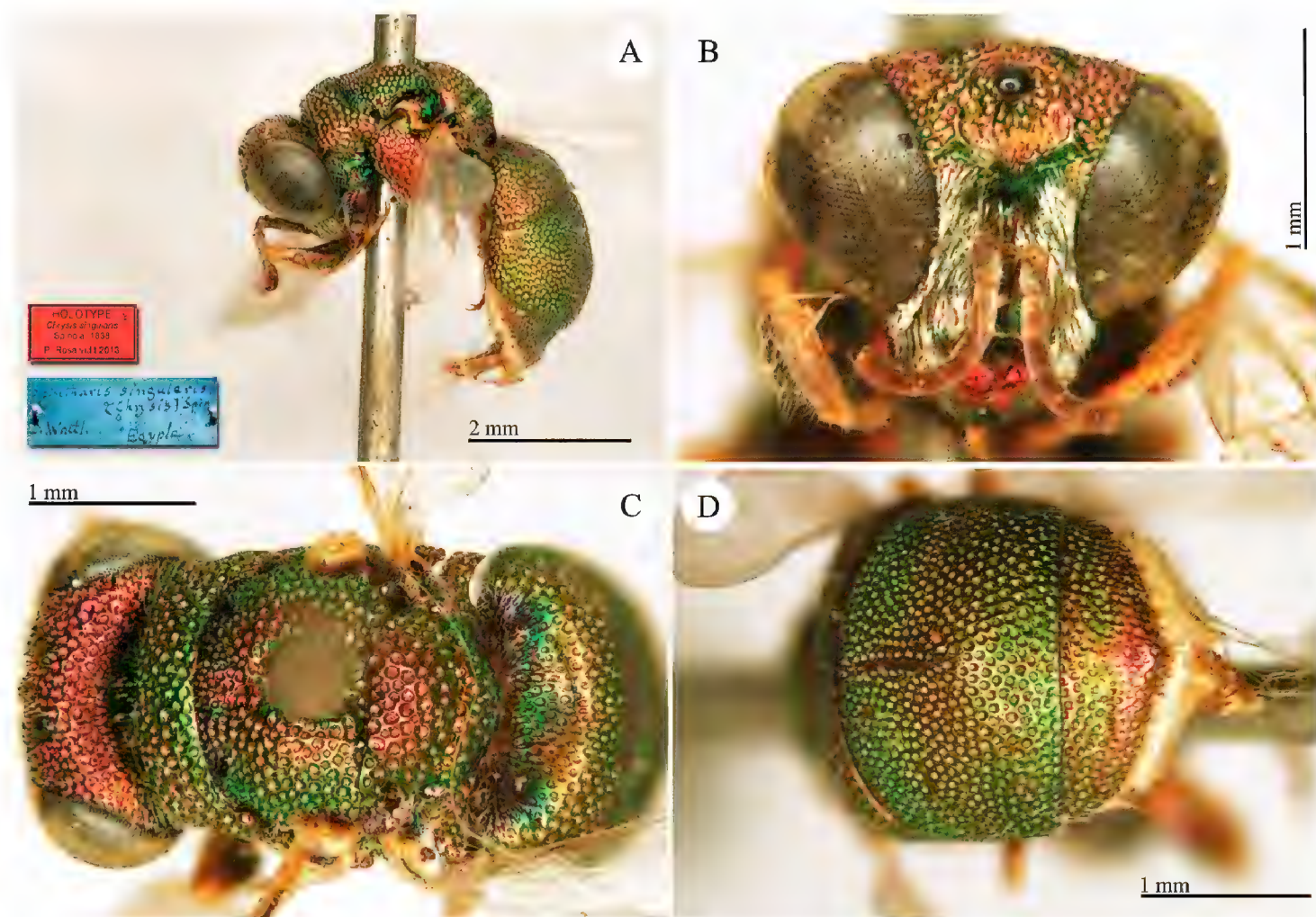
*Chrysis singularis*: Spinola 1838: 452.

**Type locality.** Egypt.

**Material. Holotype** ♀. *Spintharis singularis* (*Chrysis*) Spin. D. Walth, Égypte.

**Catalogue Casolari & Casolari Moreno.** *Spintharis singularis*, 1, 23, 91, 1 (box 52).

**Current status.** *Euchroeus singularis* (Spinola, 1838) (transferred by Linsenmaier 1959: 71).



**Plate 30.** *Chrysis singularis* Spinola, holotype **A** Habitus, lateral view **B** head, frontal view **C** mesosoma, dorsal view **D** second and third metasomal tergites, dorsal view.



***Chrysis smaragdula* Lepeletier & Serville, 1825**

Plate 31

*Chrysis smaragdula*: Lepeletier and Serville 1825: 494 *nec* Fabricius, 1775.**Type locality.** French Guyana (introduced or locality in error).**Material. Holotype** ♀. *C. smaragdula*, Fab. Lepel.; Affrica, America, 125 // 6278.**Catalogue Casolari & Casolari Moreno.** *Chrysis smaragdula*, 148, 0, 0, 1 (box 52).**Remarks.** It belongs to the *C. smaragdula* group.**Current status.** *Chrysis stilboides* Spinola, 1838 (synonymised by Kimsey and Bohart 1991: 466).***Chrysis spinigera* Spinola, 1840**

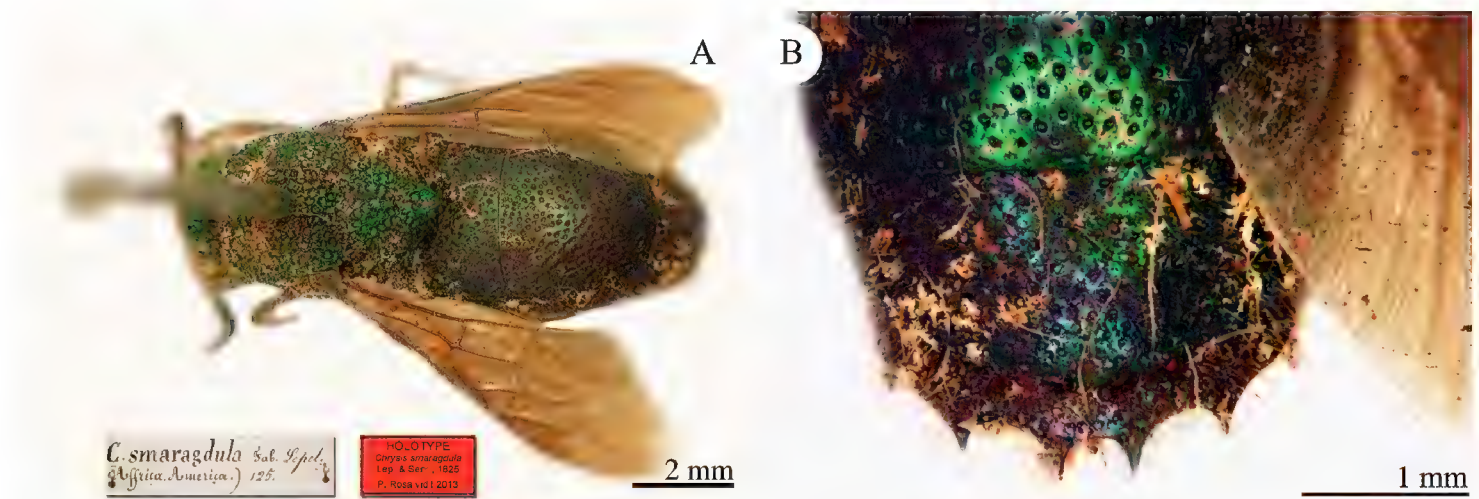
Plate 32

*Chrysis spinigera*: Spinola 1840: 201.**Type locality.** Cayenne (French Guyana).**Material. Holotype** ♀. *Chrysis spinigera*, Spin. D. Buquet, Cayenne.**Catalogue Casolari & Casolari Moreno.** *Chrysis spinigera*, 1, 56, 1, 1 (box 51).**Current status.** *Exochrysis spinigera* (Spinola, 1840) (transferred by Kimsey 1985: 271).***Chrysis splendens* Dahlbom, 1854**

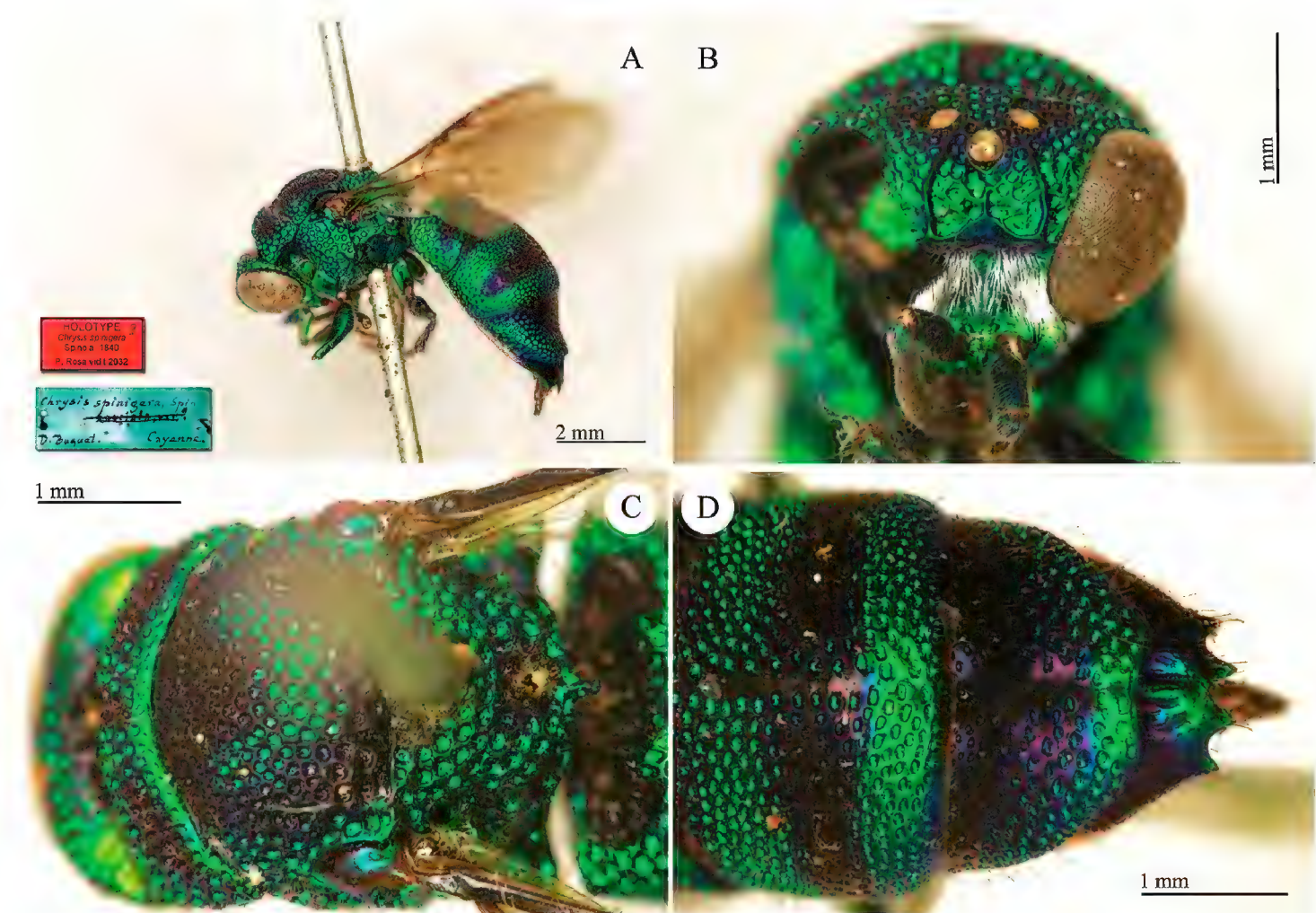
Plate 26B

*Chrysis splendens*: Dahlbom 1854: 312.**Type locality.** "Habitat in Africa meridionali ad promontorium bonae spei, Mus. D. Spinola".**Material. Lectotype** (here designated) ♂. *Chrysis splendens*, Kl. (*Pyrosomus*) Klug D. Klug, Cap. B. Esp.**Catalogue Casolari & Casolari Moreno.** *Chrysis splendens*, 132, 53, 49, 1 (box 51).**Remarks.** Dahlbom (1854) described *C. splendens* based on at least two specimens found in the Spinola collection and listed as var. *a* and var. *b*. Only one specimen seems to be preserved. This specimen is seriously damaged, missing its metasoma (except for the first tergite), its compound eyes, the flagellomeres of the right antenna, and the right foreleg. Therefore, it is impossible to assign this specimen to one of the two variations described by Dahlbom. However, the remaining part of the head and the mesosoma are species-diagnostic of this beautiful African species. Bohart (in Kimsey and Bohart 1991: 465) designated the male as lectotype in the Spinola collection, but





**Plate 31.** *Chrysis smaragdula* Lepeletier & Serville, holotype **A** Habitus, dorsal view **B** second and third metasomal tergites, dorsal view.



**Plate 32.** *Chrysis spinigera* Spinola, holotype **A** Habitus, lateral view **B** head, frontal view **C** mesosoma, dorsal view **D** second and third metasomal tergites, dorsal view.

the only specimen left in the collection is without any label. We do not consider this a valid lectotype designation and set it aside. We here designate the above specimen as lectotype of *C. splendens*, because it is housed in the author's collection (Recommendation 74D of the Code) and Bohart (1991) already listed it in this collection. It belongs to the *C. splendens* group.

**Current status.** *Chrysis splendens* Dahlbom, 1854.



***Chrysis succinctula* Dahlbom, 1854**

Plate 33

*Chrysis succinctula*: Dahlbom 1854: 179.

**Type locality.** "Habitat in Europa media et meridionali ad Berolinum, D. Klug ad Genuam D. Spinola; ad Milanum, D. Christophori."

**Material. Lectotype** (here designated) ♀. *Chrysis succinctula*, Sp. n. sp. cum var. - *Chrysis assimilis*, De Crist. Genes [Genova] et Milan.

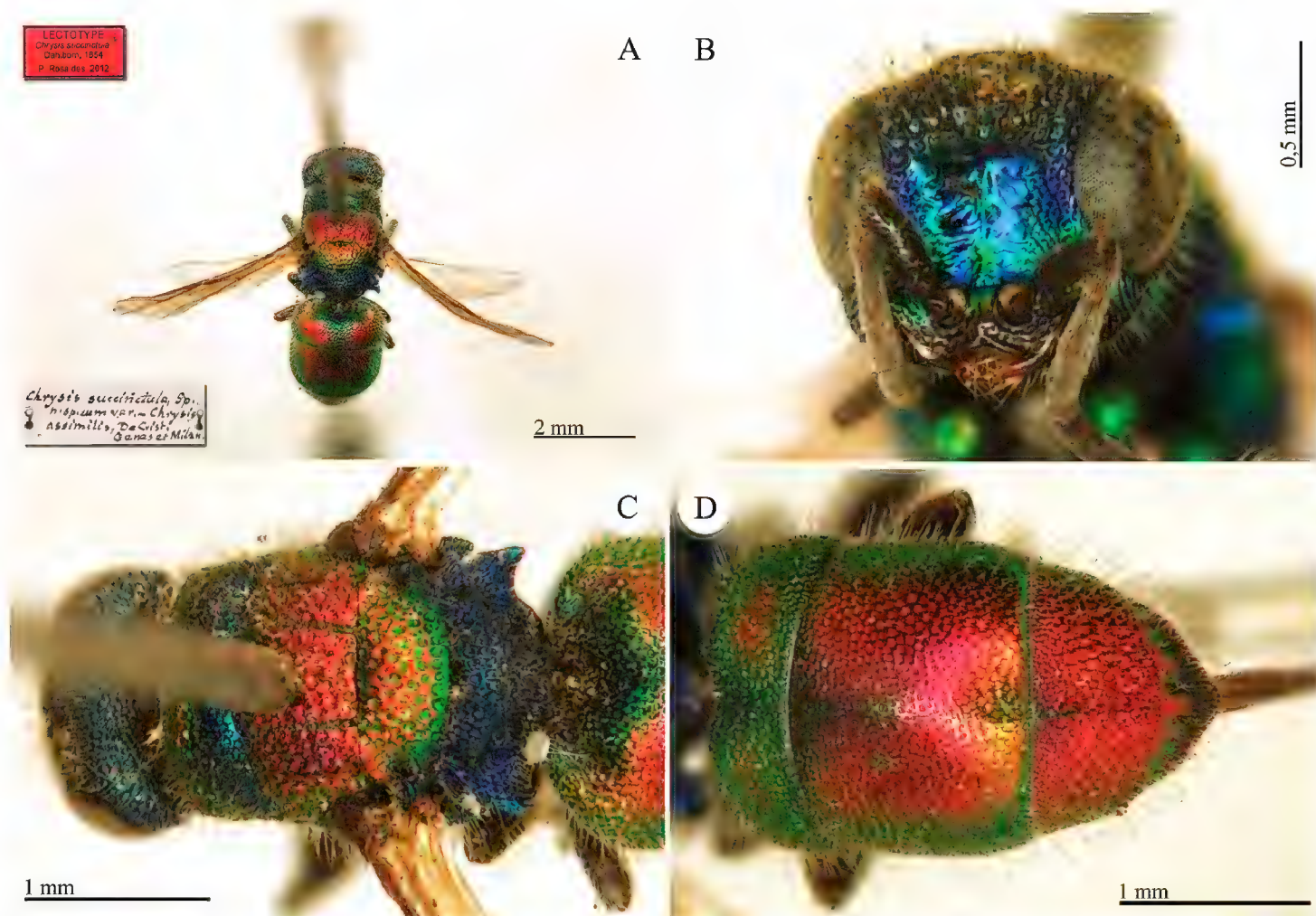
**Paralectotype** 1 ♀. idem.

**Catalogue Casolari & Casolari Moreno.** *Chrysis succinctula*, 1, 110/160, 0, 3 (box 51).

**Remarks.** The description of *C. succinctula* is based on at least three specimens: two Italian specimens collected at Genoa and Milan (listed under the unpublished names *C. succinctula* and *Chrysis assimilis* De Cristofori) housed in the Spinola collection and the third one from the MNHU (Klug), without locality. We were not able to find the specimen in MNHU. It was presumably destroyed or merged with samples of other species and now cannot be identified as syntype any more. In the Spinola collection, there are two syntypes and a third specimen collected in Corsica and belonging to the species *C. pseudogribodoi* Linsenmaier, most likely added in the column after the death of Spinola. In any case, it does not belong to the type series. The two syntypes do not match the current interpretation of the species given by Linsenmaier (1959: 115), since they belong to the species *C. germari* Wesmael, 1839. The description and the drawings given by Dahlbom agree with this new synonymy. Dahlbom described *succinctula* in his third "Phalanx" (*Chrysides ano unidentate*) and placed in this group only two species: *C. succinctula* and *C. leachii* Shuchard, 1837. Both *C. germari* and *C. leachii* have the last tergite with a visible tooth or emargination. Even Dahlbom's description of *C. succinctula* does not exclude synonymy with *C. germari*: "Pronotum 1. cyaneum 1. violascens, antice fascia aut fasciola viridi-aurea; dorsulum saturatius aureum; scutellum 1. concolor 1. viride l. cyaneum". Dahlbom (1854: 137) considered as *C. germari* the only dimorphic male of this species, which is without teeth on the anal margin. He placed the male of *C. germari* in his first "Phalanx". The description was based on one specimen received by Zetterstedt and still housed in his collection in Lund ("Habitat in Europa meridionali rar.; in Croatia a D. Germar detecta [the type]; in insula Melita maris mediterranei a D. Antonio Schembri inventa, teste D. Zetterstedt qui specimen Melitense mihi dono dedit"). Dahlbom's interpretation of this species as *C. germari* was confirmed by other authors (e.g. Eversmann 1857: 555). The only doubt relates to the third syntype; this specimen (not found in MNHU) with "scutellum cyaneum" could be related to any other species of the *succincta* group. However, the drawings to Dahlbom's description (plate IX; figs. 101a, b, c) are clear and depict *Chrysis succinctula* with the main features of *Chrysis germari*.

We select from the above specimens the only specimen in good condition as a lectotype, since the second syntype is severely damaged and its metasoma is glued to the mesosoma. The lectotype is missing the last two flagellomeres of the right antenna.





**Plate 33.** *Chrysis succinctula* Spinola, lectotype **A** Habitus, dorsal view **B** head, frontal view **C** mesosoma, dorsal view **D** metasoma, dorsal view.

The lectotype designation is given to prevent a future incorrect designation of the lectotype based on the third specimen not belonging to the syntype series; this specimen has a similar colour to *C. succinctula sensu* Linsenmaier and might create confusion. We therefore propose *Chrysis succinctula* Dahlbom, 1854 as a **new synonym** of *Chrysis germari* Wesmael, 1839.

The species identified as *C. succinctula* by Linsenmaier has to receive a new name. After having studied all possible synonyms of *C. succincta* and related taxa, the first available name for this species is *C. tristicula* Linsenmaier, 1959. Based on this research, we can summarize the results as follows:

- *Chrysis obtusiventris* Förster, 1853. Name included by Förster only in the key. The short description is enough to consider it as a valid name. Mocsáry (1889: 312) and Dalla Torre (1892: 99) placed it in doubt as a junior synonym of *C. succincta*. It was later included in the synonymic list of *C. succincta* by Kimsey and Bohart (1991: 467). Since Förster (1853) did not give a complete description of this species, the type is lost, the locality is unknown, and no author used this name as a valid species, we suggest the suppression of this name. In a different paper, we will refer the case to the Commission on the ICZN.
- *Chrysis tarsata* Dahlbom, 1854. Two syntypes collected in Berlin, examined and housed at MNHU. The species is synonym of *C. succincta* Linnaeus, 1767 *sensu auctorum*.



- *Chrysis minutula* Schenck, 1871. Mocsáry (1889: 312) placed *C. minutula* in synonymy of *C. succincta* and recognized that the type was a male and not a female. Dalla Torre (1892: 99) and Kimsey and Bohart (1991: 467) followed Mocsáry interpretation. However, the description of this species is clear and refers to a small male of *C. germari* Wesmael. Schenck considered *C. minutula* close to *C. leachii*, which is characterized by a different thorax colour (mesonotum and scutellum contrasting with the posterior margin of the prothorax and the metanotum) compared with *C. succincta*.
- *Chrysis aeneipes* Tournier, 1879. The species was described based on two syntypes (both males) collected at Peney (Geneva) on the 19<sup>th</sup> July 1876 and 25<sup>th</sup> of June 1878. The two syntypes have been examined and are still preserved in MHNG. They belong to *C. germari* Wesmael. *C. aeneipes* was already synonymized by Mocsáry (1889: 314). Kimsey and Bohart (1991: 468) placed it in synonym of *C. succincta*.
- *Chrysis frivaldszkyi* Mocsáry, 1882. *C. frivaldszkyi* was always considered as a valid species after Linsenmaier (1959). Kimsey and Bohart (1991:468) placed it in synonym of *C. succincta*, but it was later reevaluated by Strumia (1995: 5) and subsequent authors (e.g. Linsenmaier 1997, Rosa 2005). The lectotype of *C. frivaldszkyi* was examined and it matches Linsenmaier's (1959) interpretation. In the literature, this taxon is written in different ways: *C. friwaldszkyi* (Berland and Bernard 1938), *C. frivaldskyi* (Linsenmaier 1959, 1968; Strumia 1995), *C. frivaldszkii* (Kimsey and Bohart 1991). The original spelling is *C. frivaldszkyi*.
- *Chrysis bicolor* var. *abeillei* Frey-Gessner, 1887. Kimsey and Bohart (1991: 468) placed *C. abeillei* as a synonym of *C. succincta*. We could not find the type, but according to the description, the species is more closely related to *C. bicolor* and *C. illigeri*.
- *Chrysis succincta* var. *sparsepunctata* du Buysson (in André), 1892. This specimen is closely related to *C. frivaldszkyi*, as correctly interpreted by Linsenmaier (1959). The type was examined and it is housed in ISEA-PAS.
- *Chrysis succincta* var. *alicantina* Mercet, 1904. *C. alicantina* is a valid Iberian endemic species, correctly identified by Linsenmaier (1968, 1997), morphologically and chromatically different from *C. succincta* and similar to *C. chrysoscutella* Linsenmaier and *C. germari* Wesmael.
- *Chrysis succincta* var. *ignifacies* Mercet, 1904. This is a valid Iberian endemic species, closely related to *C. germari* Wesmael, but easily recognizable for the colour, the double punctuation on the metasoma, the length of the malar spaces and other morphological characteristics. *C. ignifacialis* Linsenmaier, 1959 is an unnecessary replacement name for *C. ignifacies* Mercet.
- *Chrysis succincta* var. *hirsuta* Trautmann, 1926 (*nec* Gerstaecker, 1869). The type of *C. succincta* var. *hirsuta* is lost; however, based on the description and the collecting place it belongs to *Chrysis lucida* Linsenmaier, 1951.
- *Chrysis succincta* var. *asiatica* Trautmann, 1926 (*nec* Radoszkowski, 1889). The type is lost. Balthasar (1953: 286) replaced the name *asiatica* Trautmann with the new name *ferghanensis*. Based on the original description and the key given by Balthasar, the species resembles *C. frivaldszkyi* and *C. kesleri* Radoszkowski, described from the same area.



- *Chrysis succincta* var. *germanica* Trautmann, 1926. The type is lost but the description excludes any possible synonym with *C. succincta*. *C. succincta* var. *germanica* has evident teeth and a unique body colouration. In Northern Europe and Scandinavia, the only a similar species present is *C. westerlundii*.
- *Chrysis succincta* var. *pulcherrima* Trautmann, 1926 (*nec* Lepeletier, 1806). Type lost, Balthasar (1953: 286) replaced the name *pulcherrima* with *perelegans*. Based on the description, it is clearly referable to the female of *C. albanica* Trautmann, 1927.
- *Chrysis succincta* var. *virideocincta* Trautmann, 1927 (based on the type of *C. succincta* ab. *virideocincta* Hellén, 1919, unavailable). It is a synonym of *C. bicolor* Lepeletier, 1806. The syntypes have been examined and Paukkunen et al. (2014) designated the lectotype.
- *Chrysis succincta* var. *noskiewiczi* Trautmann, 1927. The type is lost. The short description is related to a colour variation of *C. frivaldszkyi*.
- *Chrysis succincta* var. *transsylvanica* Kiss-Endre, 1927. The type is housed in MNHM and was already placed in synonymy of *Chrysis albanica* by Móczár (1965).
- *Chrysis succincta* var. *pannonica* Hoffmann, 1935. The examination of the type material in NHMW confirmed that it is a synonym of *C. frivaldszkyi* (Rosa 2009).
- *Chrysis succincta* var. *decorata* Hoffmann, 1937. Type not found. The description is clear and the species is phenotypically close to *C. bicolor* or *C. illigeri* bearing four visible teeth on the last visible tergite.
- *Chrysis succincta* var. *komareki* Balthasar, 1953. This species was already placed in synonymy of *frivaldszkyi* by Linsenmaier (1959). Kimsey and Bohart (1991) placed it in synonymy of *succincta* together with *frivaldszkyi*.
- *Chrysis succincta* f. *pumilio* Balthasar, 1953. It not even clear from the short description whether or not *pumilio* belongs to the *C. succincta* or *C. leachii* group. It could be conspecific with *C. cypruscula* Linsenmaier, 1959.
- *Chrysis tristicula* Linsenmaier, 1959, **stat. n.** is a very variable species, due to its large distribution in the Mediterranean region. The southern Spanish and Moroccan specimens show a darker colouration of the metasoma. It varies from violet to bluish on the margin of the second and third tergites. In some cases, also the margin of the first tergite can be darker to violet or bluish. This particular colouration of the metasoma is not present in the French, Italian and Swiss specimens, even if a darker to violet reflection can be found on the anal margin of the third tergite, after the pit row. However, some African specimens show the colour of the metasoma without violet or bluish reflections (Linsenmaier 1999). The only morphological distinctive characteristics given by Linsenmaier to identify this species is the punctuation of the body "a little" finer and on the metasoma "a little" denser (*Pkt ein wenig feiner, auf Abd auch etwas dichter*) than *C. succincta*. This characteristic is observed not only in the African specimens, but also in the Spanish ones. The Alpine specimens show a different punctuation, with sparse punctures decreasing in diameter on the second tergite, from the base to the apical margin, with shining intervals. However, the colour and the punctuation on the metasoma vary more or less gradually from the Alps to South Spain, but all the main morphological characteristics, from the length



of the flagellomeres (with F-III longer than F-II) to the genital capsula, remain the same in all the examined specimens from the SW Mediterranean countries.

**Current status.** *Chrysis germari* Wesmael, 1839.

### ***Chrysis truncatella* Dahlbom, 1854**

Plate 34

*Chrysis truncatella*: Dahlbom 1854: 195.

**Type locality.** "Habitat in Brasilia, Mus. Spinolae; qui specimen e Collectione Latreillei acceptum benigne communicavit".

**Material. Holotype** ♀. *Chrysis truncatella*, Spin. inédit Coll. Latr. M. Buquet. Brésil.

**Catalogue Casolari & Casolari Moreno.** *Chrysis truncatella*, 1, 34, 1, 1 (box 51).

**Current status.** *Caenochrysis parvula* (Fabricius, 1804) (synonymised and transferred by Kimsey and Bohart 1991: 303).

### ***Chrysis varicornis* Spinola, 1838**

Plate 35

*Chrysis varicornis*: Spinola 1838: 449.

**Type locality.** Egypt.

**Material. Holotype** ♂. *Chrysis varicornis*, Spin. M. Walth, Égypte.

**Catalogue Casolari & Casolari Moreno.** *Chrysis varicornis*, 1, 23, 95, 2 (box 50).

**Remarks.** Two specimens are found under the name *C. varicornis* in the Spinola collection. One does not belong to the type series bearing the label: "*Espagne, M. Rambur*". The second specimen is likely the type but does not carry a label. However, the main label states: "*Chrysis varicornis, Spin. / M. Walth. Égypte*". It matches the current interpretation of the species. It belongs to the *C. radians* group.

**Current status.** *Chrysura varicornis* (Spinola, 1838) (transferred by Kimsey and Bohart 1991: 497).

### ***Chrysis versicolor* Spinola, 1808**

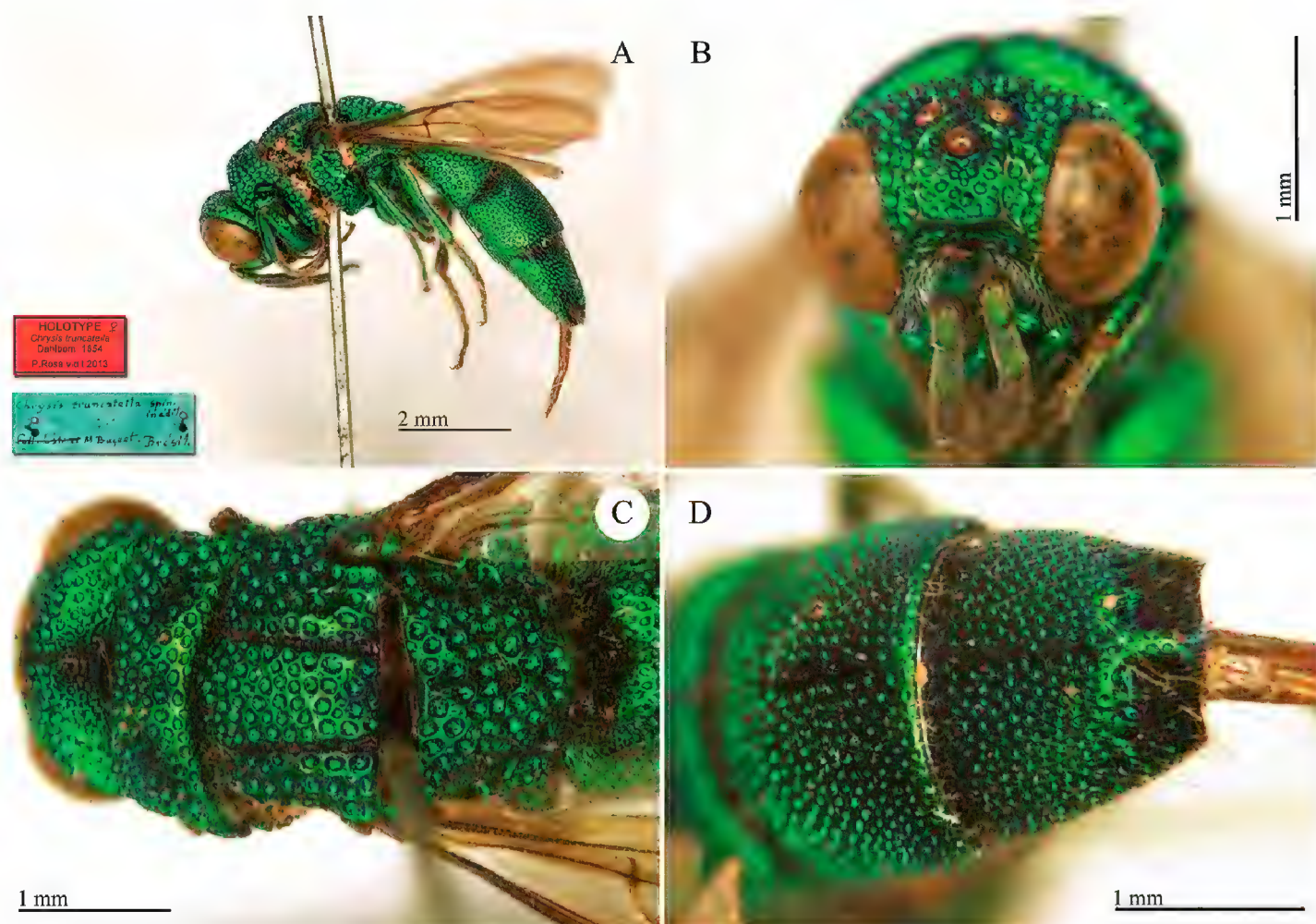
Plate 36

*Chrysis versicolor*: Spinola 1808: 241.

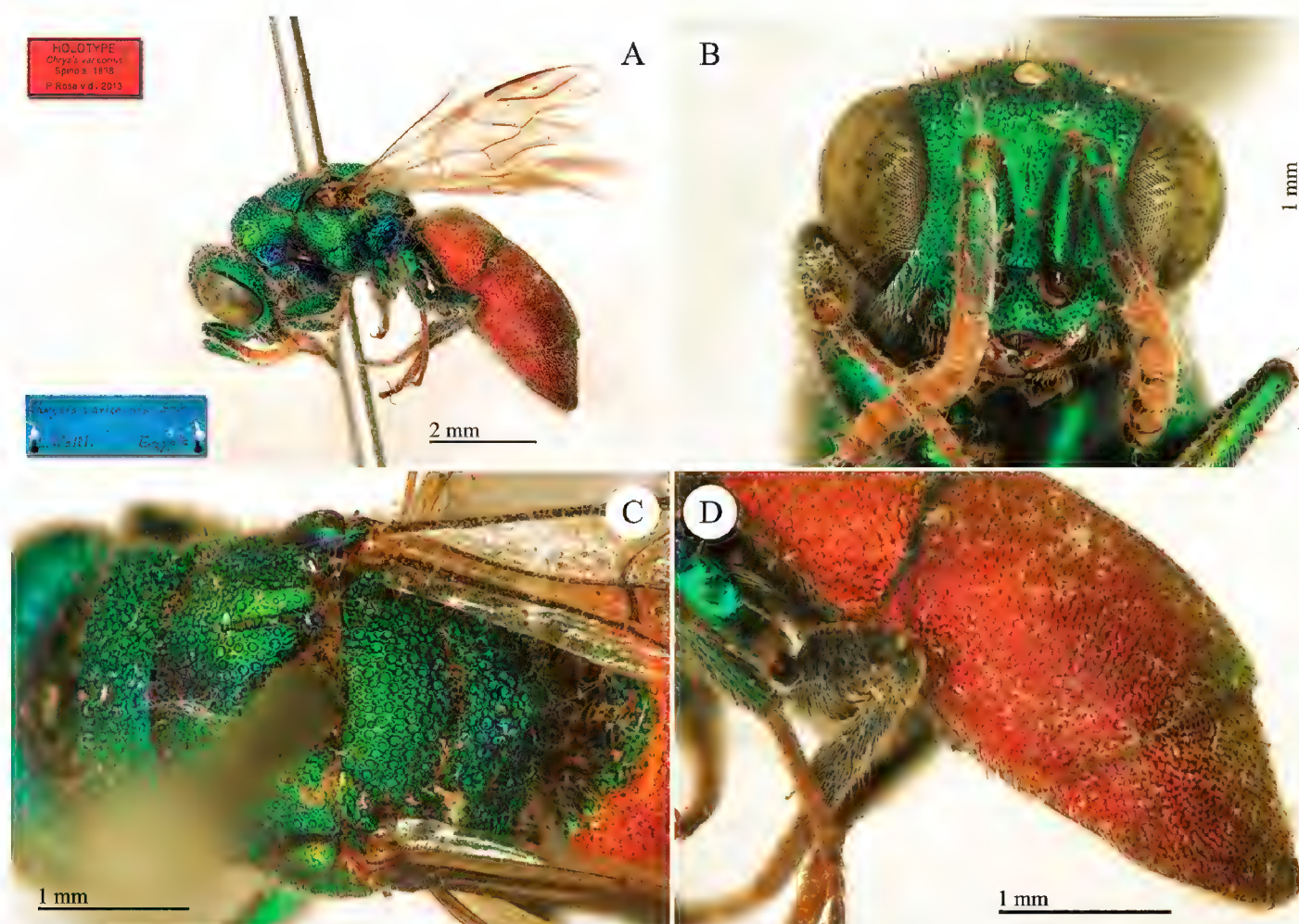
**Type locality.** "Habitat passim in Liguria, haud infrequens".

**Material. Lectotype** (here designated) ♀. *Chrysis versicolor*, Spin. Ins. Lig. Typus.  $\beta$  var *e* Coll. Latr. Genes [Genoa].





**Plate 34.** *Chrysis truncatella* Dahlbom, holotype **A** Habitus, lateral view **B** head, frontal view **C** mesosoma, dorsal view **D** second and third metasomal tergites, dorsal view.



**Plate 35.** *Chrysis varicornis* Spinola, holotype **A** Habitus, lateral view **B** head, frontal view **C** mesosoma, dorsal view **D** metasoma, lateral view.



**Catalogue Casolari & Casolari Moreno.** *Chrysis versicolor*, 1, 110, 0, 2 (box 51).

**Remarks.** Only two specimens are found under the name *C. versicolor* in the Spinola collection. One is not a syntype, since it bears a rounded label (6295) and was acquired with other specimens of the Latreille collection. The second specimen is labelled "Type", and it was collected at Genoa, as written on the main label. Spinola's description is surely based on a syntype series ("*haud infrequens*"), therefore we here designate as lectotype the last syntype left in the collection, even though the specimen is badly damaged. It lacks the metasoma, the right flagellum and almost all of the left flagellum; only the right mesoleg is complete. However, many diagnostic characteristics are still visible and even the sex is identifiable.

**Current status.** *Spintharina versicolor* (Spinola, 1808) (transferred by Kimsey and Bohart 1991: 558).

### ***Elampus gayi* Spinola, 1851**

Plate 37

*Elampus gayi*: Spinola 1851: 413.

**Type locality.** Chile. "De Santa Rosa y de la Ligua".

**Material. Lectotype** (here designated) ♀. *Elampus Gayi*, Spin. / D. Gay, Chili. //

**Paralectotype** 1♀. *Elampus Gayi* Spinola, det. L. D. French.

**Catalogue Casolari & Casolari Moreno.** *Elampus gayi*, 1, 52, 32, 1 (box 50).

**Remarks.** French labelled the specimen as paralectotype, but the designation was not published. The species was described based on at least two males (*sexo dudoso*) collected at Santa Rosa and Ligua. The second syntype is housed in MNHN (du Buysson 1898: 519). Du Buysson completed the description of this species, even though the specimen was missing the head and part of metasoma. Later, du Buysson (1899: 160) removed this specimen from the catalogue of the types housed in the MNHN. Since the syntype in MNHN is badly damaged and it was not considered as a type by du Buysson (1899), we here designate the syntype of *E. gayi* as lectotype in the Spinola collection, according to the Recommendation 74D of the Code. The specimen is in good condition, even though it is missing the last three flagellomeres of the left antenna and five of the right antenna.

**Current status.** *Elampus gayi* Spinola, 1851.

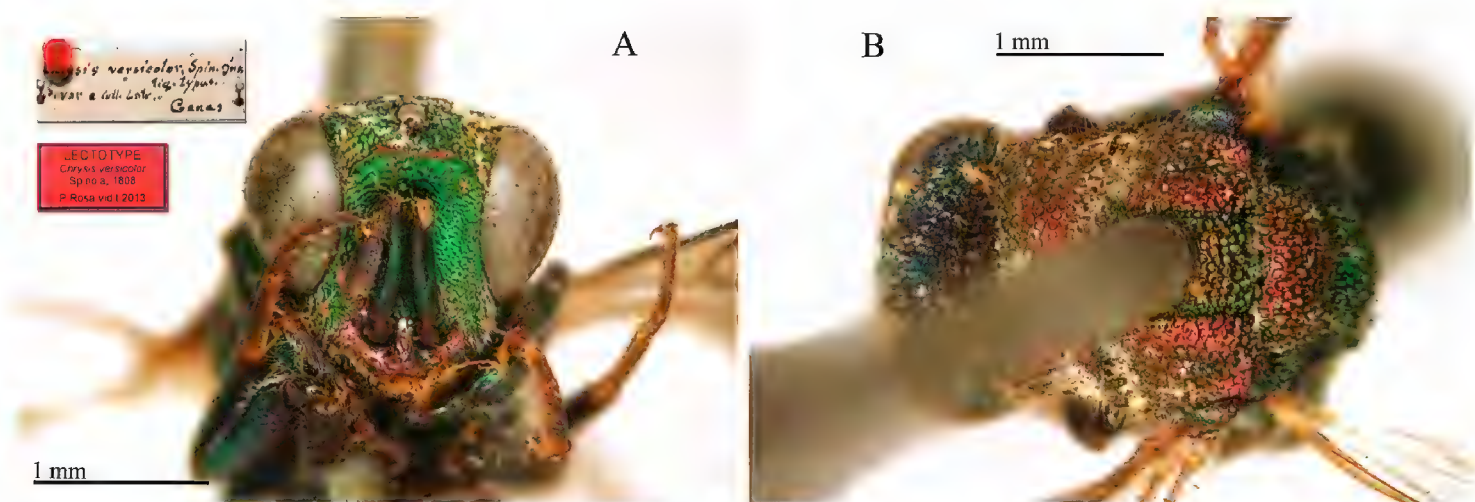
### ***Euchroeus candens* Dahlbom, 1854**

Plate 38

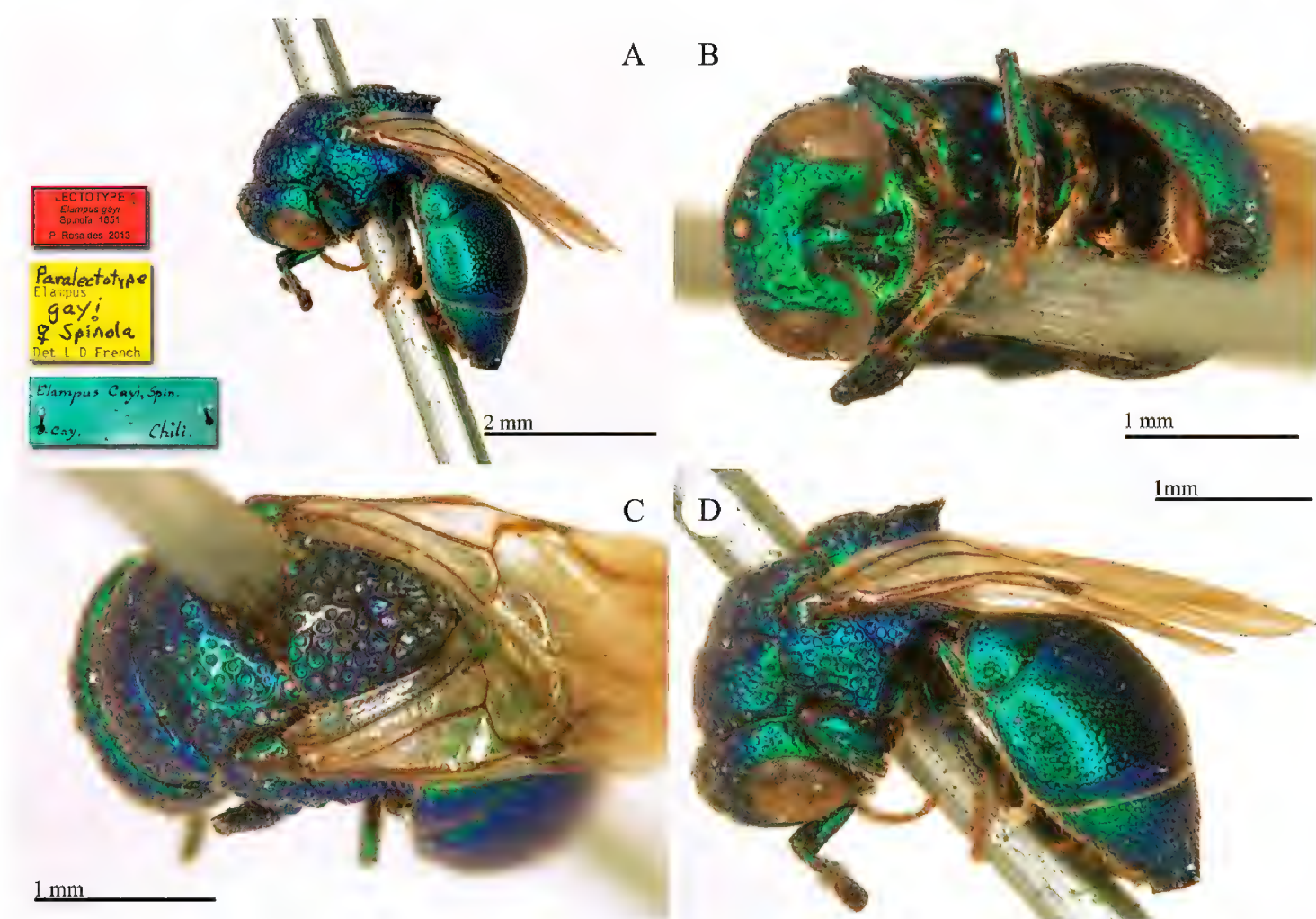
*Euchroeus candens*: Dahlbom 1854: 371 *nec* Germar, 1817.

**Type locality.** "Habitat in Africa ad promontorium bonae spei; Mus. Dom. Spinola".





**Plate 36.** *Chrysis versicolor* Spinola, lectotype **A** Head, frontal view **B** mesosoma, dorsal view.



**Plate 37.** *Elampus gayi* Spinola, lectotype **A** Habitus, lateral view **B** head, and anal margin of the last tergite, frontal view **C** mesosoma, dorsal view **D** habitus, lateral view.

**Material.** Holotype ♀. *Euchroeus candens*, Kl. / D. Klug, Cap. B. Esp.

**Catalogue Casolari & Casolari Moreno.** *Euchraeus* (sic) *candens*, 132, 53, 49, 1 (box 52).

**Remarks.** In Kimsey and Bohart (1991: 297), under the name *Brugmoia* [= *Euchroeus*] *torrida* (Mocsáry, 1889). The generic name *Euchroeus* Latreille was conserved by the International Commission on Zoological Nomenclature (ICZN, Opinion 1906). The name *candens* was considered as a junior secondary homonym of *C. candens* Germar, 1817 (currently *Chrysura candens*) by Mocsáry (1889). Since the



two respective species have been considered as belonging to different genera after 1889, the name *E. candens* must be considered as a valid name (Madl and Rosa 2012: 84).

**Current status.** *Euchroeus candens* Dahlbom, 1854.

### ***Euchroeus coerulans* Dahlbom, 1854**

*Euchroeus coerulans*: Dahlbom 1854: 372 nec Fabricius, 1804.

**Type locality.** "Habitat in Africa ad promontorium bonae spei, Mus. Dom. Spinola".

**Material. Holotype** (sex unknown): *Euchroeus coerulans*, Kl. // D. Klug, Cap. B. Esp.

**Catalogue Casolari & Casolari Moreno.** *Euchraeus coerulans*, 132, 53, 49, 1 (box 52).

**Remarks.** The type is badly damaged, having no head and metasoma, (except first tergite, which is still present).

**Current status.** *Euchroeus candens* Dahlbom, 1854 (synonymised by Mocsáry 1889: 600).

### ***Hedychrum brasilianum* Dahlbom, 1854**

Plate 39

*Hedychrum brasilianum*: Dahlbom 1854: 59.

**Type locality.** "Habitat in Brasilia: D. Buquet, Mus. Spinolae".

**Material. Holotype** ♂. *Hedychrum brasilianum* Spin. D. Klug. Brasil // **Holotype** *Hedychrum brasilianum* ♂ Dahlbom det. L. D. French.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum brasilianum*, 1, 34, 1, 1 (box 50).

**Remarks.** The type is in bad condition. It lacks the head, forelegs, right mesoleg, and the tarsi of the right metaleg. The ventral surface of the metasoma is missing due to a dermestid attack.

**Current status.** *Hedychrum brasilianum* Dahlbom, 1854.

### ***Hedychrum caerulescens* Lepeletier, 1806**

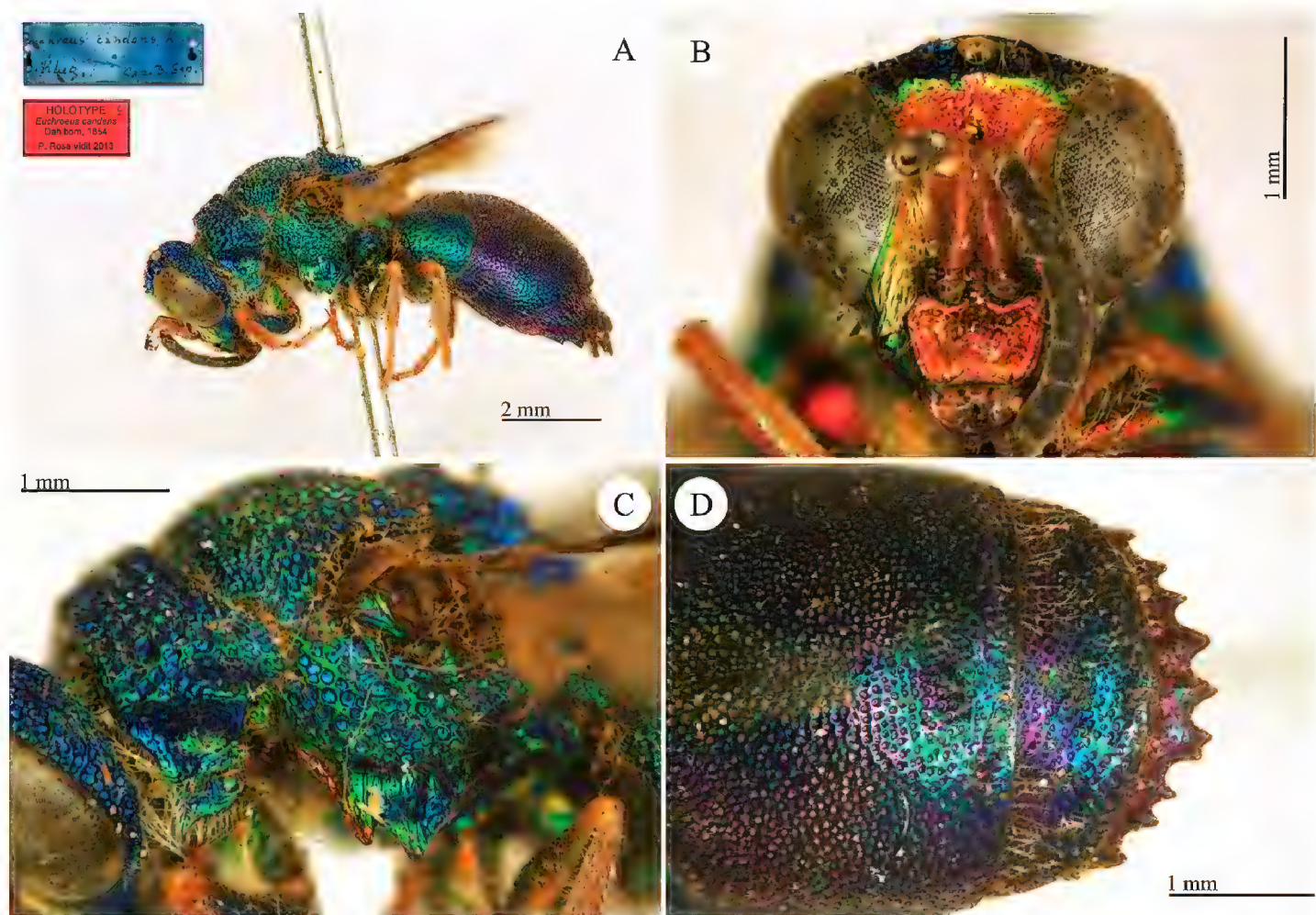
*Hedychrum caerulescens*: Lepeletier 1806: 122.

**Type locality.** "Mâle et femelle. Donné par M. Walkenaer qui l'a trouvée aux environs de Paris".

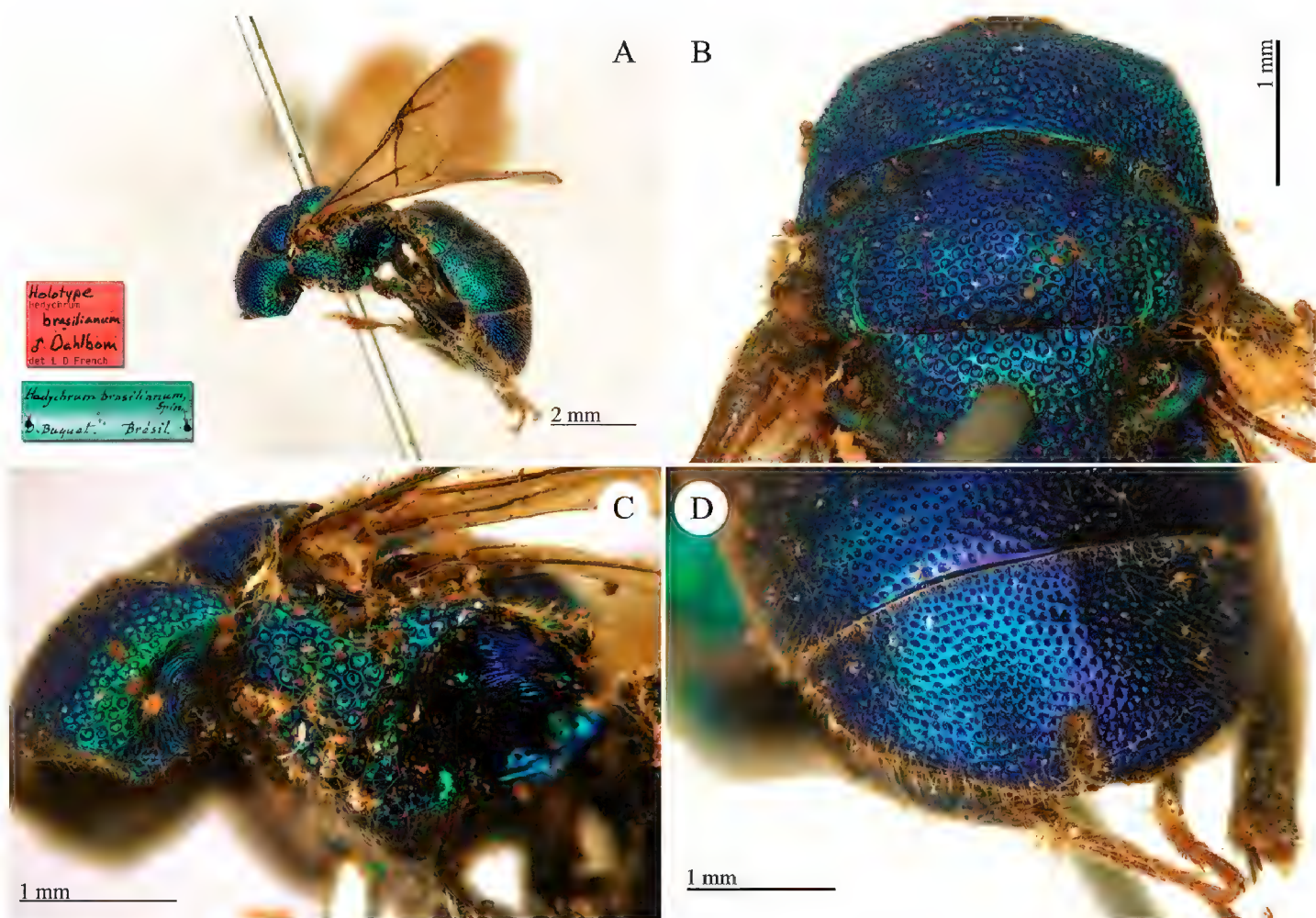
**Material. Lectotype** (here designated) ♂. *H. caeruleus* (*Chrysis*) Deg. [De Geer] – (*Omalus*) Dhlbm. *Hedychrum caerulescens* Lepel. 122 coll. St. Fargeau, Parisiae.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum caeruleus*, 36, 185, 53, 1 (box 50).





**Plate 38.** *Euchroeus candens* Dahlbom, holotype **A** Habitus, lateral view **B** head, frontal view **C** mesosoma, lateral view **D** second and third metasomal tergites, dorsal view.



**Plate 39.** *Hedychrum brasilianum* Dahlbom, holotype **A** Mesosoma and metasoma, lateral view **B** mesosoma, dorsal view **C** mesosoma, lateral view **D** third metasomal tergite, dorsal view.



**Remarks.** Lepeletier (1806) described *H. caerulescens* based on two specimens, one male and one female. One of these two syntypes was acquired by Spinola and belongs to the species *Pseudomalus violaceus* (Scopoli, 1763); the second syntype is housed at MNHN. Du Buysson (1898: 563) listed one specimen in Lepeletier's collection *H. caerulescens* = *Ellampus caeruleus* (De Geer), but it is not listed as a type. We examined the second syntype (currently in the general collection MNHN box 8). It belongs to the same species, *P. violaceus* (Scopoli), even though it is placed under the name of *Omalus aeneus* (Fabricius).

We designate as lectotype of *He. caerulescens* Lepeletier the syntype male. The reason is to fix the synonym with *P. violaceus* (Scopoli). The specimen is damaged, lacking its fore wings and left hind wing, and it is partially covered by mould.

**Current status.** *Pseudomalus violaceus* (Scopoli, 1763) (synonymised by Dalla Torre 1892: 19; transferred by Kimsey and Bohart 1991: 270).

### *Hedychrum chloroideum* Dahlbom, 1854

*Hedychrum chloroideum*: Dahlbom 1854: 66 (given as var. *b*).

**Type locality.** "Habitat in Europa media et meridionali mensibus Majo - Julio passim; Turcia: D. Drewsen; Graecia: D. Loew; Austria: D. D. De Christophori, Kollár et Megerle von Mühlfeld; Silesia: D. Zeller".

**Material. Lectotype** (here designated) ♂. *Hedychrum chloroideum* // (*Chrysis*) Ziegl. // D. De Cristofori, Autriche.

**Paralectotypes** 3 ♂♂. idem.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum chloroideum*, 84, 9, 19, 4 (box 50).

**Remarks.** The specimens of *He. chloroideum* collected in Austria by Ziegler and listed as syntypes by Dahlbom (1854: 66) are still housed in the Spinola collection. The syntype series given by Dahlbom includes specimens collected in Turkey (coll. Drewsen, ZMUC), Greece (coll. Loew), Austria (coll. De Christophori, Kollár, Megerle, MRSN), and Silesia (coll. Zeller, LZM). The original description is based only on males, characterized by the green colour, sometimes light green to blue-green. The name *chloroideum* is derived from this particular colouration. The female is easily recognizable by the shape and the colouration of its body. It has an elongated metasoma and red-purple colour on head and on the dorsal part of the mesosom. The metasoma, the propodeum, and ventral surface are a contrasting blue colour. In Dahlbom's time, the female was known as *He. fervidum* (Fabricius). Males and females were considered as different species because of the remarkable sexual dimorphism and dichroism. *Ho. chloroidea* (Dahlbom, 1854) as well as *Ho. curvata* (Förster, 1853) (name with priority) had been considered as a valid species for a very long time. The hypothesis given by Trautmann (1922: 321) that *Ho. curvata* (= *Ho. chloroidea*) could be the male of *Ho. fervida* was not immediately accepted (e.g. Invrea, 1923: 13). Once the synonym was



accepted, all the authors agreed on this fact, except Linsenmaier. Linsenmaier (1959, 1968, 1969) considered *Ho. chloroidea* as a separate subspecies of *Ho. fervida* distributed in Asia Minor, Syria, Palestine, and Cyprus. His interpretation, even though not in contrast with the original distribution of *Ho. chloroideum* as outlined by Dahlbom, can be a source of taxonomical instability. This is because the oriental form of *Ho. fervida*, exhibiting a coarser punctuation, is currently referred to as *Ho. fervida* ssp. *buyssoni* Mercet, 1902. To retain nomenclatural stability, we designate a lectotype of *He. chloroideum* Dahlbom that clearly does not refer to this subspecies. We select the specimen from the above three mentioned ones that is only partially damaged, lacking the right flagellum, tibia and tarsi of the left foreleg, femur, tibia and tarsi of the mid and left metaleg.

Kimsey (1986: 108) designated a lectotype of *He. chloroideum* Dahlbom at MNHN, but the designation was based on a female collected in France ("env. de Paris") and found in the Lepeletier collection. The original description is based only on males and no syntype was collected in France or was housed in Lepeletier's collection. This specimen is not a syntype and therefore it cannot be considered as a lectotype, according to the Art. 74.2.

**Current status.** *Holopyga fervida* (Fabricius, 1781) (synonymised by Trautmann 1922: 321).

### ***Hedychrum coelestinum* Spinola, 1838**

*Hedychrum coelestinum*: Spinola 1838: 454.

**Type locality.** "Egypte".

**Material. Holotype** (?) ♀. *Hedychrum coelestinum* Kl. D.D. Walth Égypte et Klug, Cap. B. Esp. // **Paralectotype** *Hedychrum coelestinum* ♀ Spinola det. L. D. French.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum coelestinum*, 132, 23/53, 95, 2 (box 50).

**Remarks.** In the Spinola collection, two specimens from Egypt (D. Walth) and South Africa (Cap B. [onne] Esp. [érance]) (D. Klug)) referring to this species are present. Only one specimen belongs to the original type series. However, it is currently impossible to state which one, since both specimens lack locality labels. At present, we cannot identify the specimen that had been collected in Egypt. Both specimens were examined by Dahlbom (1854: 60) and they are found under the name "*Hedychrum caelestinum* Kl.", a species never described by Klug. Dahlbom (1854) erroneously assigned this species to Klug and not to Spinola, even though he knew Spinola's (1838) paper. Furthermore, Dahlbom (1854) named this species "*caelestinum*", which we consider an incorrect subsequent spelling (Madl and Rosa 2012: 96). The two specimens were labelled as lectotype and paralectotype by L.D. French, but the lectotype designation has not been published. The two females have different colours: one is greenish and the second is a deep blue. The blue one was labelled by French as paralectotype, but



the colour matches Spinola's description ("*La couleur du corps est d'un bleu plus intense*") and we suppose that this one could be the type. In Dahlbom's collection in LZM, there is another specimen labelled as type by a former curator, not by Dahlbom himself, and that refers to the specimen listed as "*caelestinum* Kl." (Dahlbom 1854: 60).

**Current status.** *Hedychrum coelestinum* Spinola, 1838.

### ***Hedychrum difficile* Spinola, 1851**

Plate 40

*Hedychrum difficile*: Spinola 1851: 410.

**Type locality.** Chile.

**Material. Lectotype** (here designated) ♀. *Hedychrum difficile*, Spin. D. Gay, Chili. // **Paralectotype** *Hedychrum difficile* ♂ Spinola det. L. D. French.

**Paralectotype** (sex unknown): idem // **Paralectotype** 1 ♂. *Hedychrum difficile* Spinola, det. L. D. French.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum difficile*, 1, 52, 32, 2 (box 50).

**Remarks.** Spinola (1851: 411) described *He. difficile* on various female specimens, and at least one specimen considered as a possible male ("*Macho dudoso*", "*Uno solo de los individuos cojidos por M. Gay está en este caso.*"). In the Spinola collection there are two specimens collected in Chile by Gay matching the original description and bearing French's paralectotype labels. The lectotype designation has not been published, however. French (1985: 622) wrote that he examined the female holotype in MNHN; this information was later reported in Kimsey and Bohart (1991: 174). *He. difficile* is a common species in Chile and the specimen found at MNHN (box number 16 of the general collection) is a syntype as well. Du Buysson (1899: 161, sub *Hedychridium*) listed the specimen in MNHN without any type status.

We designate a lectotype of *He. difficile*. It is a female (not male, as reported on the label) in perfect condition; the second specimen, the paralectotype, is badly damaged, being without metasoma, legs and two wings. We prefer to designate the specimen in MRSN because it is based on a specimen housed in the collection of the describing author (Recommendation 74D of the Code).

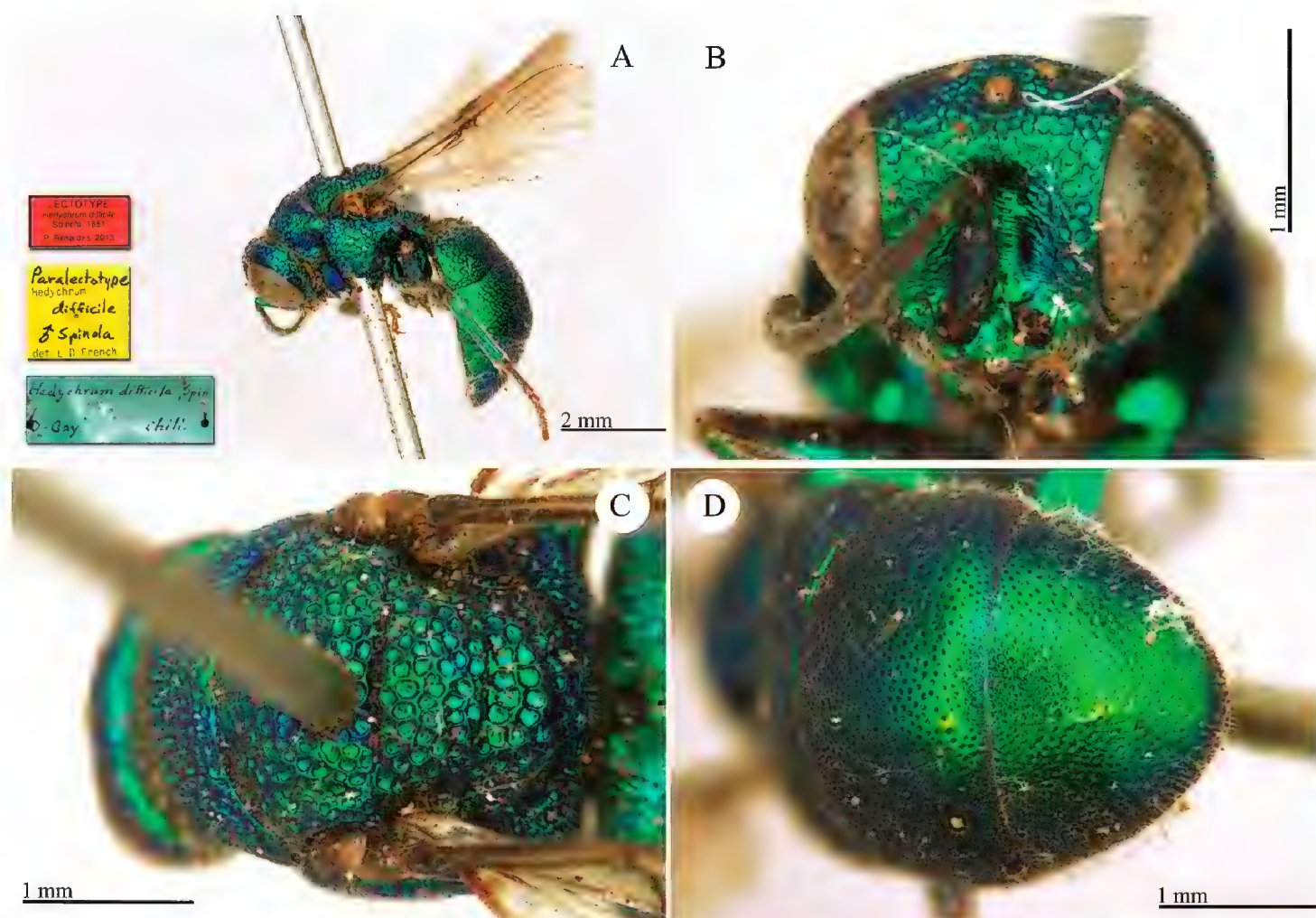
**Current status.** *Exallopyga difficile* (Spinola, 1851) (transferred by French 1985: 622).

### ***Hedychrum minutum* var. *duponti* Dahlbom, 1854**

*Hedychrum minutum* var. *duponti*: Dahlbom 1854: 83. (given as *Hedychrum minutum* var. *c*).

**Type locality.** "Exemplar *varietatis c* e Mexico a D. Dupont reportatum in Museo Excell. Spinolae (*Hedychrum Duponti* Spin." nominatum) examinavi".





**Plate 40.** *Hedychrum difficile* Spinola, lectotype **A** Habitus, lateral view **B** head, frontal view **C** mesosoma, dorsal view **D** second and third metasomal tergites, dorsal view.

**Material. Holotype** (sex unknown): *Hedychrum Duponti* Spin. / *Hed. Minutum* var. Dhlbm / D. Dupont. Mexico.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum duponti*, 1, 154, 23, 1 (box 50).

**Remarks.** The type is closely related to *Hedychridium krajniki* Balthasar, 1946. The type locality could be in error.

**Current status.** *Hedychridium duponti* Dahlbom, 1854.

### *Hedychrum incrassatum* Dahlbom, 1854

Plate 41

*Hedychrum incrassatum*: Dahlbom 1854: 73.

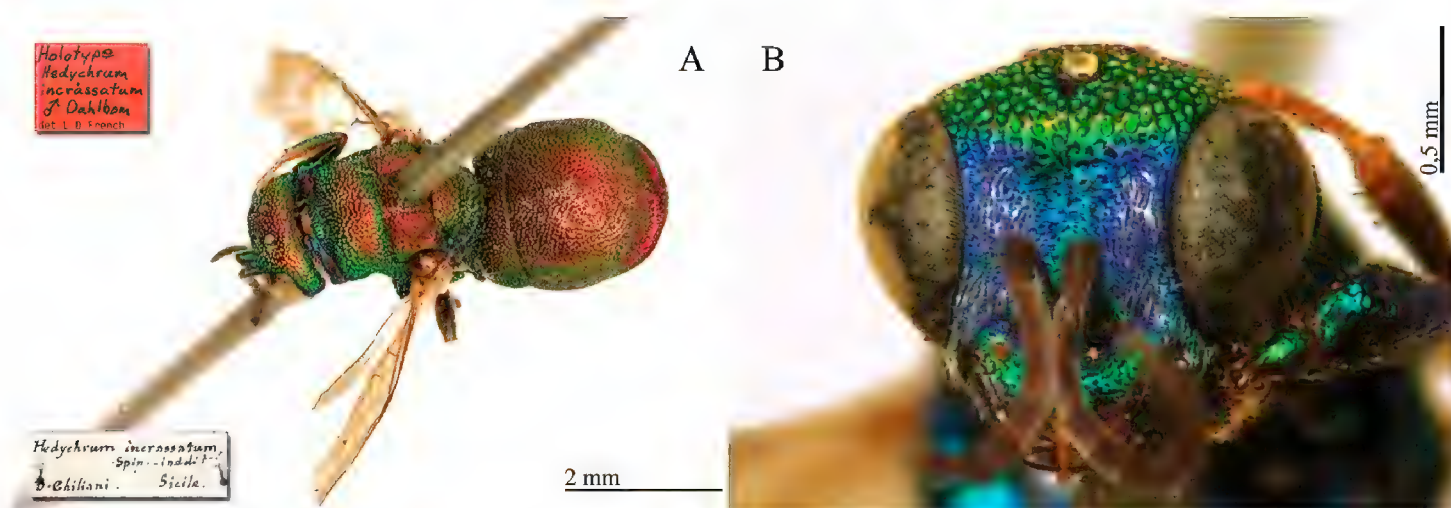
**Type locality.** "Habitat in Sicilia: D. Chiliani (sic), Mus. D. Spinolae".

**Material. Holotype** ♂. *Hedychrum incrassatum* / Spin. - inedit; D. Ghiliani, Sicile.  
// **Holotype** *Hedychrum incrassatum* ♂ Spinola det. L. D. French.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum incrassatum*, 1, 204, 33, 1 (box 50).

**Current status.** *Hedychridium incrassatum* (Dahlbom, 1854) (transferred by du Buysson (in André), 1891: 188).





**Plate 41.** *Hedychrum incrassatum* Dahlbom, holotype **A** Habitus, dorsal view **B** head, frontal view.

### *Hedychrum rutilans* Dahlbom, 1854

*Hedychrum rutilans*: Dahlbom 1854: 76.

**Type locality.** "Habitat in Anglia, Germania, Gallia, Hispania, passim".

**Material. Syntypes** 2 ♂♂, ♀. *Hedychr. rutilans*, Meg. var. c, Dhlbm. - *Hed. regium*, Lep. Liguria.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum rutilans*, 186, 145, 0, 3 (box 50).

**Remarks.** Dahlbom (1854) described *He. rutilans* based on a syntype series subdivided into three varieties (var. *a*, var. *b*, var. *c*). The syntypes listed by Dahlbom are housed in the following museums: *He. rutilans* var. *a*: NHMW (*teste* Kollar), MNHU (*teste* Klug), ZMUC (*teste* Drewsen); *He. rutilans* var. *b*: MNHU (*teste* Klug); *He. rutilans* var. *c*: MRSN (Spinola coll., "*Hedychrum regium* Pellet. secund. Spin. in litt." e "*Hedychrum intermedium* Mus. Spinolae"). These syntypes are still housed in the listed museums. Morgan (1984: 10) designated the lectotype on a specimen collected by Zeller and housed in the Dahlbom Collection at LZM. This specimen is labelled: "*Hed. rutilans* Megerl. Dahl. var. *a*". According to the Art. 74.2 of the Code this specimen is not a syntype, therefore it loses its status of lectotype.

The name *He. rutilans* is a matter of conflict between entomologists. The history of the names *He. rutilans* and *He. intermedium* is long and complicated. Linsenmaier (1959, 1968, 1997a, 1997b, 1999) used the name *He. intermedium* Dahlbom, 1845, instead of *He. rutilans* Dahlbom, 1854, as many other authors did in the past. In various European collections, specimens belonging to this species are still found under the name *He. intermedium*. Many entomologists, in fact, still follow Linsenmaier's interpretation. Linsemaier never accepted the synonymy proposed by Morgan (1984: 8) and that was accepted by Kimsey and Bohart (1991). Morgan (1984), in fact, discovered that the holotype of *He. intermedium* belongs to the genus *Holopyga*. Unfortunately, Morgan did not provide any further information on the species nor in which museum he examined this type. After an extensive tour in the European museums, we found out that the type of *He. intermedium* is housed

in LZM. Kimsey and Bohart (1991: 232) wrote that they examined this holotype at MNHN, and later Linsenmaier (1997a) argued that Dufour's specimens are housed at MNHN. After studying all relevant type material at MNHN and after having conducted an extensive literature survey, we are confident in writing that not one specimen labelled "*Hol. intermedia* Gall. Dufour", "*Holopyga intermedia*" or "*Hedychrum intermedium*" is housed at MNHN. In the "General collection" in MNHN there are two specimens labelled "*Hedychrum rutilans*" and "*Coll. Dufour 1834*". These two specimens had not been studied by Morgan, yet they were listed by du Buysson (1898: 521) and mentioned as possible "types" by Linsenmaier (1997a), since their labels match the original data cited by Dahlbom (1845). Based on the erroneous information given by Kimsey and Bohart (1991) on the type depository, Linsenmaier (1997a) did not accept Morgan's interpretation and stated that labels must have been exchanged. Moreover, Linsenmaier argued that it was not possible that Dahlbom, who described the genus *Holopyga* in the same paper, would have confused it with *Hedychrum*.

At the beginning of our studies, we agreed with Linsenmaier and we also noticed that no other European *Hedychrum* has the described colour "*♂ thorax antice viridis postice cyaneus*"; only the male of *Ho. ignicollis sensu* Linsenmaier (= *Holopyga aureomaculata* Abeille) shows a similar colouration. We concluded that Morgan probably confused the type of *He. intermedium* with the type of another mysterious species described in the same work by Dahlbom on Dufour material collected in France: *Holopyga nitidula*. In this sense, the examination of the Dahlbom collection in LZM was fundamental. The specimen cited by Morgan is indeed the type of *He. intermedium*. This confirmation is not only based on the precise labels, already cited by Morgan, but also on the morphological and chromatic characteristics given by Dahlbom. This specimen is a male of *Ho. fervida* (Fabricius, 1781) with colouration similar to *Ho. fervida* var. *taorminensis* Trautmann: pronotum and mesonotum light bluish-greenish, in contrast with the rest of the mesosoma. But the most important characteristic is the punctuation on the mesosoma: '*pronotum et dorsulum nitida sparse punctata*'. No *Hedychrum* species has this peculiar punctuation, but *Ho. fervida* has it.

It is not strange that Dahlbom in 1845 identified the male of *Ho. fervida* as *Hedychrum*. In fact, Dahlbom in 1854 described again the males of *Ho. fervida* as *He. chloroideum*, based on specimens entirely green or bluish-green, without any contrasts in the colouration of the mesosoma.

It seems that Linsenmaier was influenced by Richards (1935: 158). This important author received the type of *He. intermedium* and *He. rutilans* by Kemner (Lund): "*Through the kindness of Dr. N. A. Kemner, we have examined the type of Hedychrum rutilans Dahlbom, 1854. It is a female bearing two labels (1) "Z. Mer." or "L. Mer." and (2) "Hed. rutilans. Megerl. Secund. M.B. Dhbm. var. a." The specimen agrees with Dahlbom's description of his var. a. (i.e. the typical form of the species) and also with the modern interpretation of his name (e.g. Trautmann, 1928). Dr. Kemner also sent what is almost*



certainly the type of *Hedychrum intermedium* Dahlbom, 1845. This species was described in 1845 from France but in 1854 Dahlbom dropped the name *intermedium*; his var. c. of *H. rutilans* agrees with the earlier described *intermedium*. The probable type of *intermedium* is a male bearing two labels: (1) "*Hedychr. rutilans* Dhlbm. var. c." and (2) "*Hab. Fontainebleau Collect. Barbut. This specimen agrees with the original description of intermedium. It is a male of one of the greenish forms of H. rutilans. It may be described as follows: - Green; slight trace of copper on central lobe of mesonotum. Postscutellum and propodeum blue. Abdomen green, disc of second tergite and whole of third, copper-tinged. Legs blue. Venter of abdomen black. In my opinion, therefore, the species should be known as Hedychrum intermedium Dahlbom, 1845*".

Nevertheless, Richards did not realize that none of the examined specimens was truly a type. In particular, *He. intermedium* did not match the original type, since it was collected at Fontainebleau by Barbut and not by Dufour. This should be the reason different authors, including Linsenmaier, considered *He. intermedium* had priority over the name *He. rutilans*.

In conclusion, we formally propose here the new synonymy: *Hedychrum intermedium* Dahlbom, 1845 = *Holopyga fervida* (Fabricius, 1781). The valid name for one of the most common European species is therefore *He. rutilans* Dahlbom, 1854, as already stated by Morgan (1984).

**Current status.** *Hedychrum rutilans* Dahlbom, 1854.

### ***Hedychrum virens* Dahlbom, 1854**

Plate 26C

*Hedychrum virens*: Dahlbom 1854: 74.

**Type locality.** "Habitat in Rossia meridionali et Lusitania forte rarissime".

**Material. Lectotype** (here designated) ♂. *Hedychrum virens* Kl. Dlbm ♀. Coll. Rambur. Russ. mer. // Sud Russ.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum virens*, 135, 199, 74, 1 (box 50).

**Remarks.** Dahlbom (1854: 74) described *He. virens* based on two specimens, one male and one female: the male was collected in Portugal (Lusitania) and housed in MNHU; the female was collected in Southern Russia and housed in the Spinola collection. We found that the specimen in the Spinola collection is a male and not a female. We designate this specimen as lectotype of *He. virens* since it matches the current interpretation of the species. It is in perfect condition and it is prepared with open wings. It is possible that the Iberian population could be considered as a separate subspecies. The species shows a peculiar distribution, and in Western Europe is found only on the Iberian Peninsula. The rest of its known distribution extends from Greece over the Middle East to central Asia. There are some old records from Italy collected in the 19th century in various museums (MRSN, MHNG, MCZ).

**Current status.** *Hedychrum virens* (Dahlbom, 1854).

***Holopyga janthina* Dahlbom, 1854**

Plate 42

*Holopyga janthina*: Dahlbom 1854: 50.

**Type locality.** "Habitat in Africa, ad Promontorium Bonae Spei a D. Westermann detecta et ibidem a D. Draege revisa. Museis D. D. Westermann et Spinola".

**Material. Lectotype** (here designated) ♀. *Hedychrum janthinum* (*Holopyga*) Dahlb. - Dr D. Draege. Cap. B. Esp. // **Lectotype** *Holopyga janthina* ♀ Dahlbom det. L. D. French.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum janthinum*, 27, 53, 21, 1 (box 50).

**Remarks.** Dahlbom (1854: 50) described *Ho. janthina* based on a series of specimens received by Westermann and Draege. These syntypes are now housed in MRSN and ZMUC. French pinned a lectotype label, but the designation has not been published. We designate a lectotype of *Ho. janthina* Dahlbom, using the same syntype that was selected by French, to fix the current interpretation of the species. The head of the lectotype is broken and glued on a white label; the right antenna is without the last six flagellomeres, the left one is without the last seven flagellomeres, the right foreleg is missing the tibia and tarsi; the right mesoleg and the forelegs are without the last tarsi.

**Current status.** *Holopyga janthina* Dahlbom, 1854.

***Holopyga luzulina* Dahlbom, 1854**

Plate 43

*Holopyga luzulina*: Dahlbom 1854: 49.

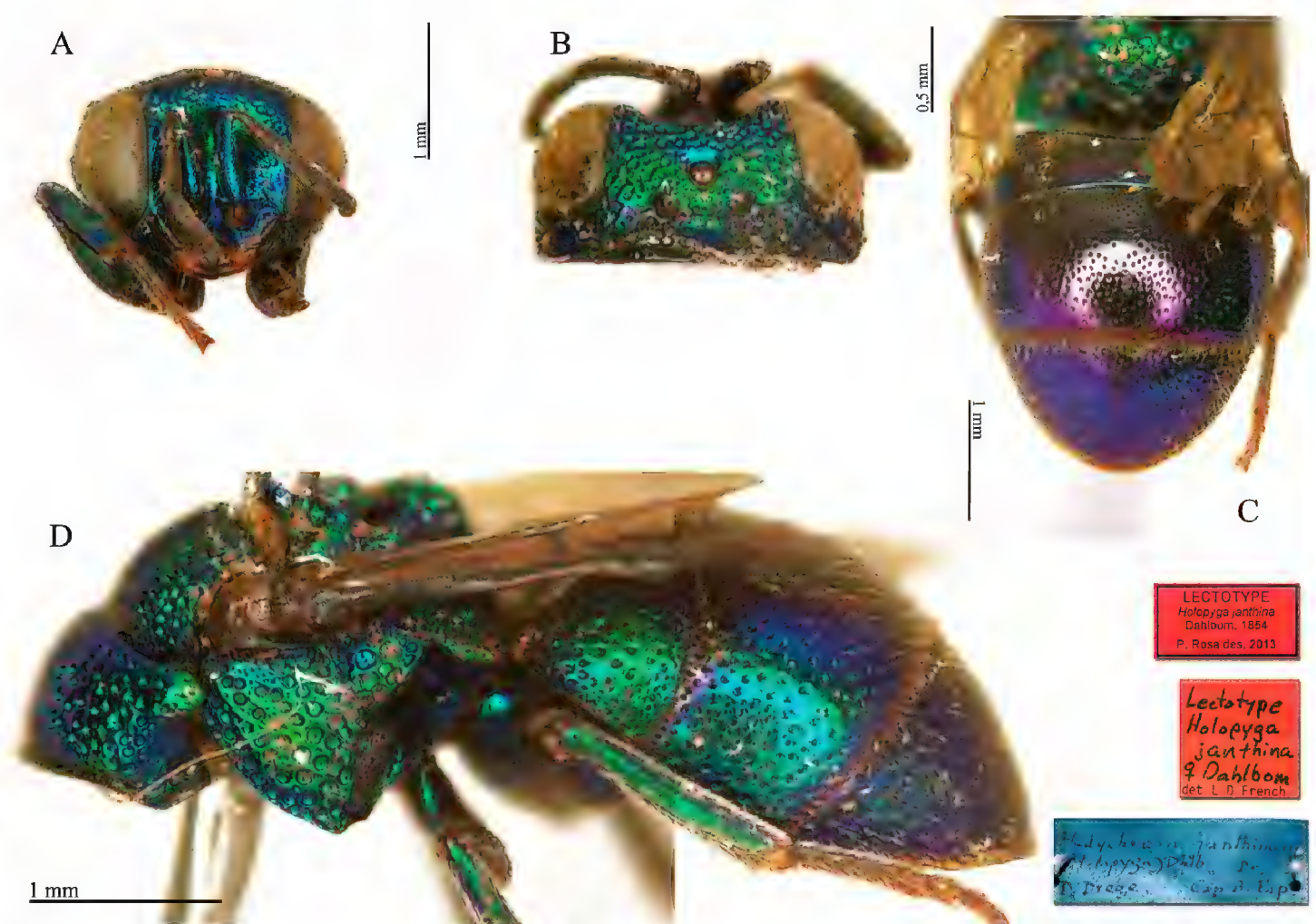
**Type locality.** "Habitat in Brasilia, D. D. Milde et Spinola, qui specimina benevole communicarunt".

**Material. Lectotype** (here designated) ♂. *Hedychrum lazulinum* (*Holopyga*) Dahlb. - M.B. Klug. D. Klug. Brasil // **Lectotype** ♂. *Holopyga luzulina* Dahlbom, det. L. D. French.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum lazulinum*, 27, 34, 49, 2 (box 50).

**Remarks.** Dahlbom (1854: 49) described *Ho. luzulina* based on two specimens received from Milde and Spinola. French labelled the specimen in the Spinola collection as lectotype, but the designation has not been published. Since we could not find the second syntype in MNHU, we designate the lectotype of *Ho. luzulina* Dahlbom to fix the current interpretation of the species. After Dahlbom, many South American *Holopyga* have been described, and there is the possibility that the other syntype belongs to a different species, as found in other cases (e.g. *Holopyga dohrni* Dahlbom, 1854, with





**Plate 42.** *Holopyga janthina* Dahlbom, lectotype **A** Head, frontal view **B** head, dorsal view **C** metasoma, dorsal view **D** mesosoma and metasoma, lateral view.

different syntypes from U.S.A. and Cuba). The type is missing tibia and tarsi of the right foreleg and left mesoleg and also the femora, tibiae, and tarsi of the left metaleg; a thin mould layer covers the right side of the body. The second specimen placed under the name *Ho. luzulina* is a male of *He. rutilans* Dahlbom, 1854, most likely placed in this position in recent times.

**Current status.** *Holopyga luzulina* Dahlbom, 1854.

### *Holopyga ovata* Dahlbom, 1854

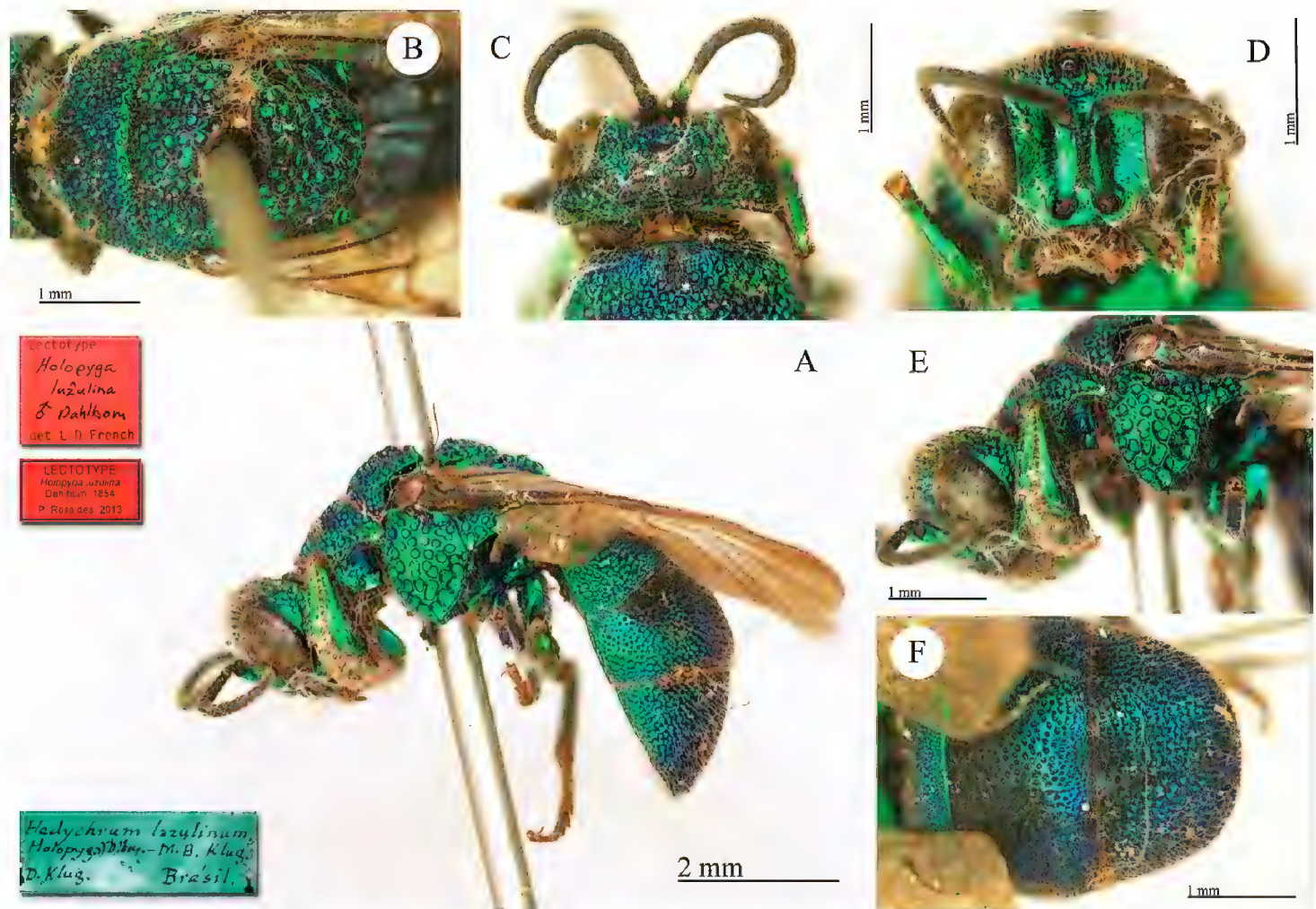
*Holopyga ovata*: Dahlbom 1854: 51.

**Type locality.** "In Insulis Archipelagi: D. Loew; Italia: D. Spinola; Austria: D. Kollâr; Prussia: D. D. Dohrn et Lüben; Svecia: Scania (ad Esperöd d. 12. Augusti 1838), – Ostro-Gothia (in monte Omberg d. 22. Juli 1835 in copula cum var. c!) et Gottlandia (in pratis Gothem d. 18. Juli 1841) mihi obvia".

**Material. Syntype** 1 ♀. *Hedychrum ovatum* (*Chrysis*) Pallas – (*Holopyga*) Dahlb. var. B – *Hedych. regium* olim Lombardia.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum ovatum*, 199, 144, 0, 1 (box 50).





**Plate 43.** *Holopyga luzulina* Dahlbom, lectotype **A** Habitus, dorsal view **B** Mesosoma, dorsal view **C** head, dorsal view **D** head, frontal view **E** head and mesosoma lateral view **F** second and third metasomal tergites, dorsal view.

**Remarks.** The syntype is badly damaged; the head and metasoma are glued on a separated label pinned in box 52.

**Current status.** *Holopyga generosa* (Förster, 1853) (synonymised by Linsenmaier 1987: 135).

### *Parnopes denticulatus* Spinola, 1838

Plate 44

*Parnopes denticulatus*: Spinola 1838: 455.

**Type locality.** Egypt.

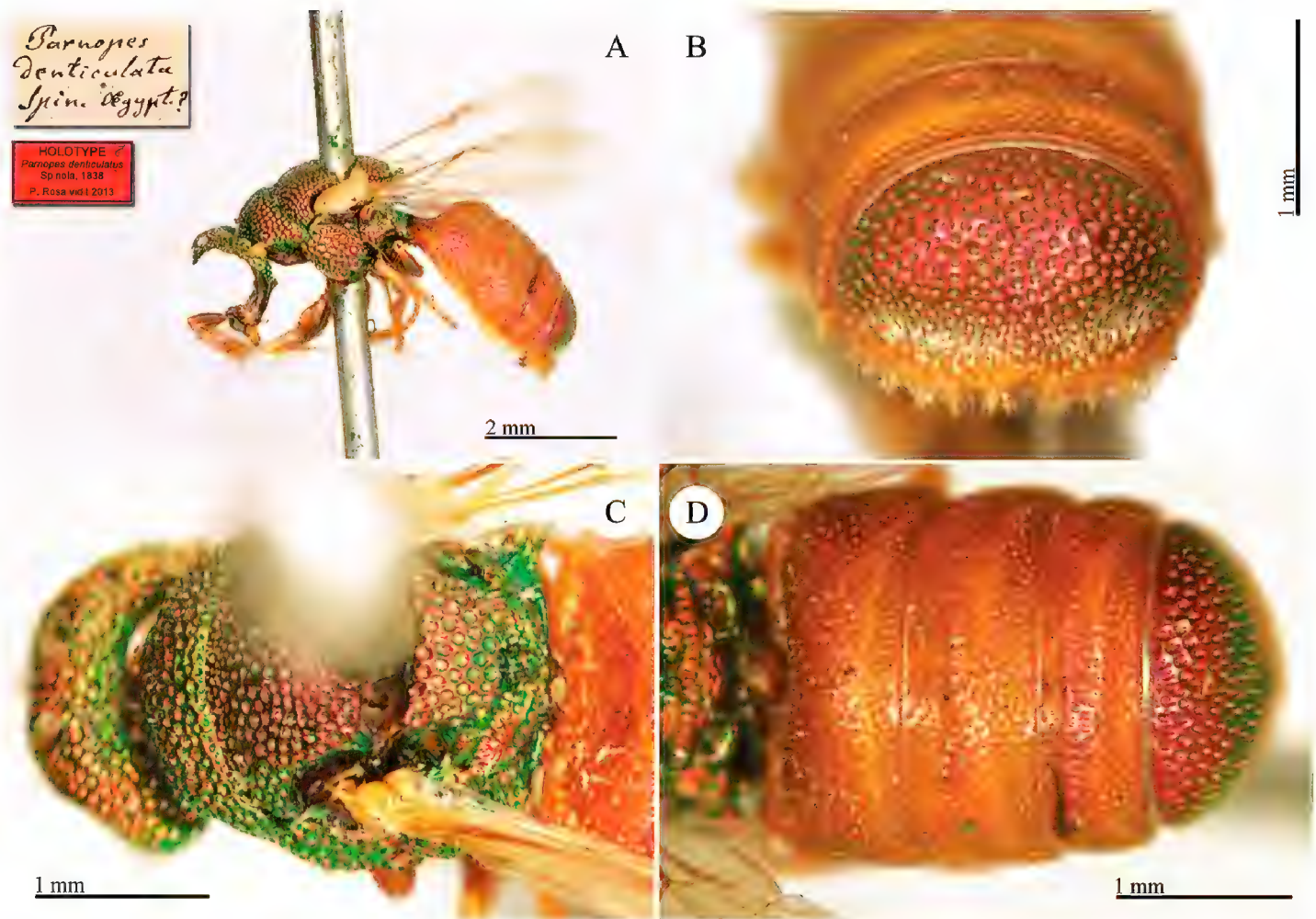
**Material. Holotype** ♂. *Parnopes denticulatus* Spin. / D. Walzl Égypte.

**Catalogue Casolari & Casolari Moreno.** *Parnopes denticulatus*, 1, 23, 0, 1 (box 52).

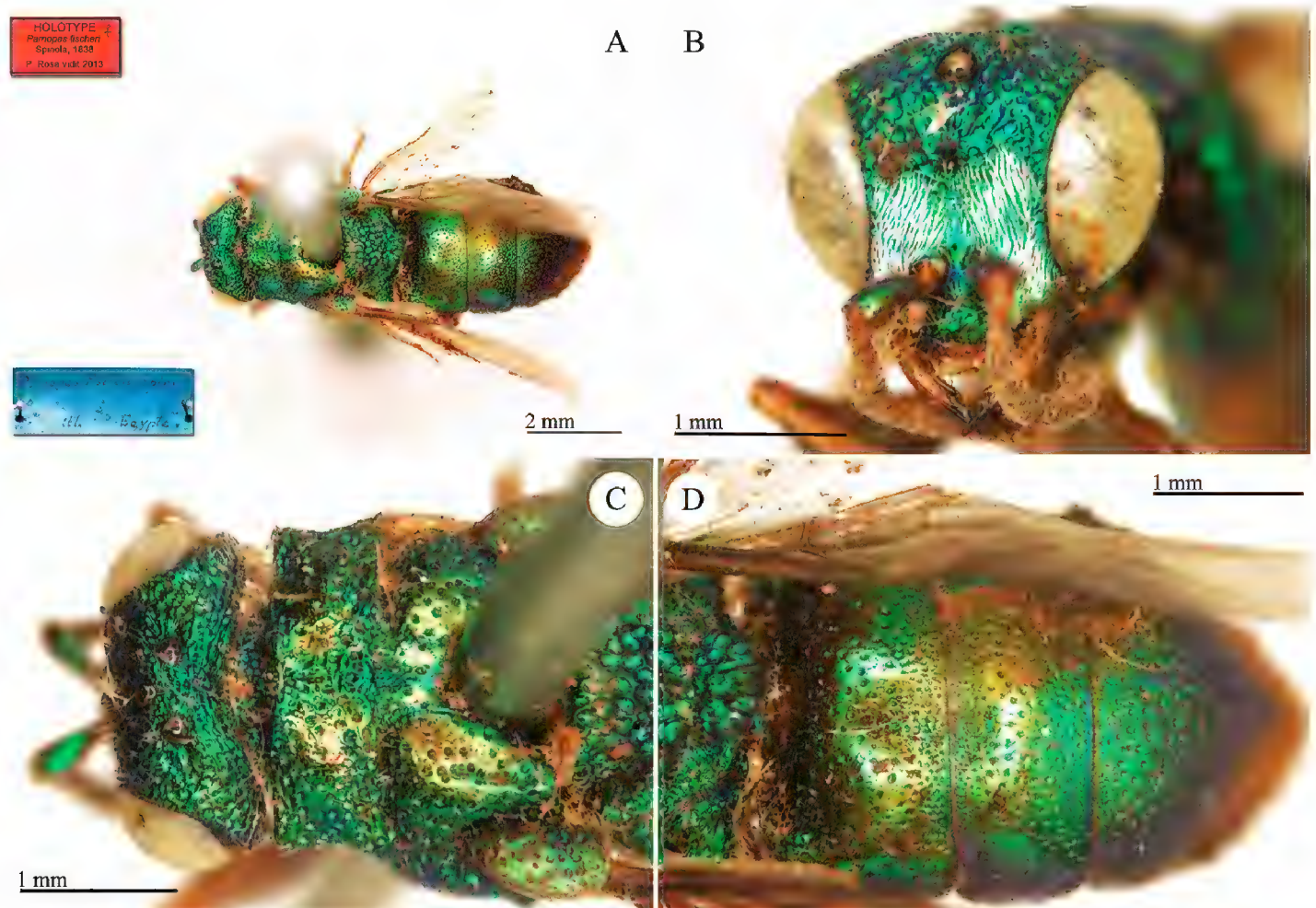
**Remarks.** The type is badly damaged, without the dorsal and frontal part of the head; only the occipital part as far as the mandible complex, the clypeus and antennae are left.

**Current status.** *Cephaloparnopes denticulatus* (Spinola, 1838) (transferred by Kimsey and Bohart 1991: 578).





**Plate 44.** *Parnopes denticulatus* Spinola, holotype **A** Habitus, lateral view **B** fourth metasomal tergite, posterior view **C** mesosoma, dorsal view **D** metasoma, dorsal view.



**Plate 45.** *Parnopes fischeri* Spinola, holotype **A** Habitus, dorsal view **B** head, frontal view **C** head and mesosoma, dorsal view **D** metasoma, dorsal view.

***Parnopes fischeri* Spinola, 1838**

Plate 45

*Parnopes fischeri*: Spinola 1838: 455.**Type locality.** Egypt.**Material. Holotype** ♀. *Parnopes Fischeri*, Spin.; Égypte ?**Catalogue Casolari & Casolari Moreno.** *Parnopes fischeri*, 1, 23, 91, 1 (box 52).**Current status.** *Parnopes fischeri* Spinola, 1838.***Pyria stilboides* Spinola, 1838**

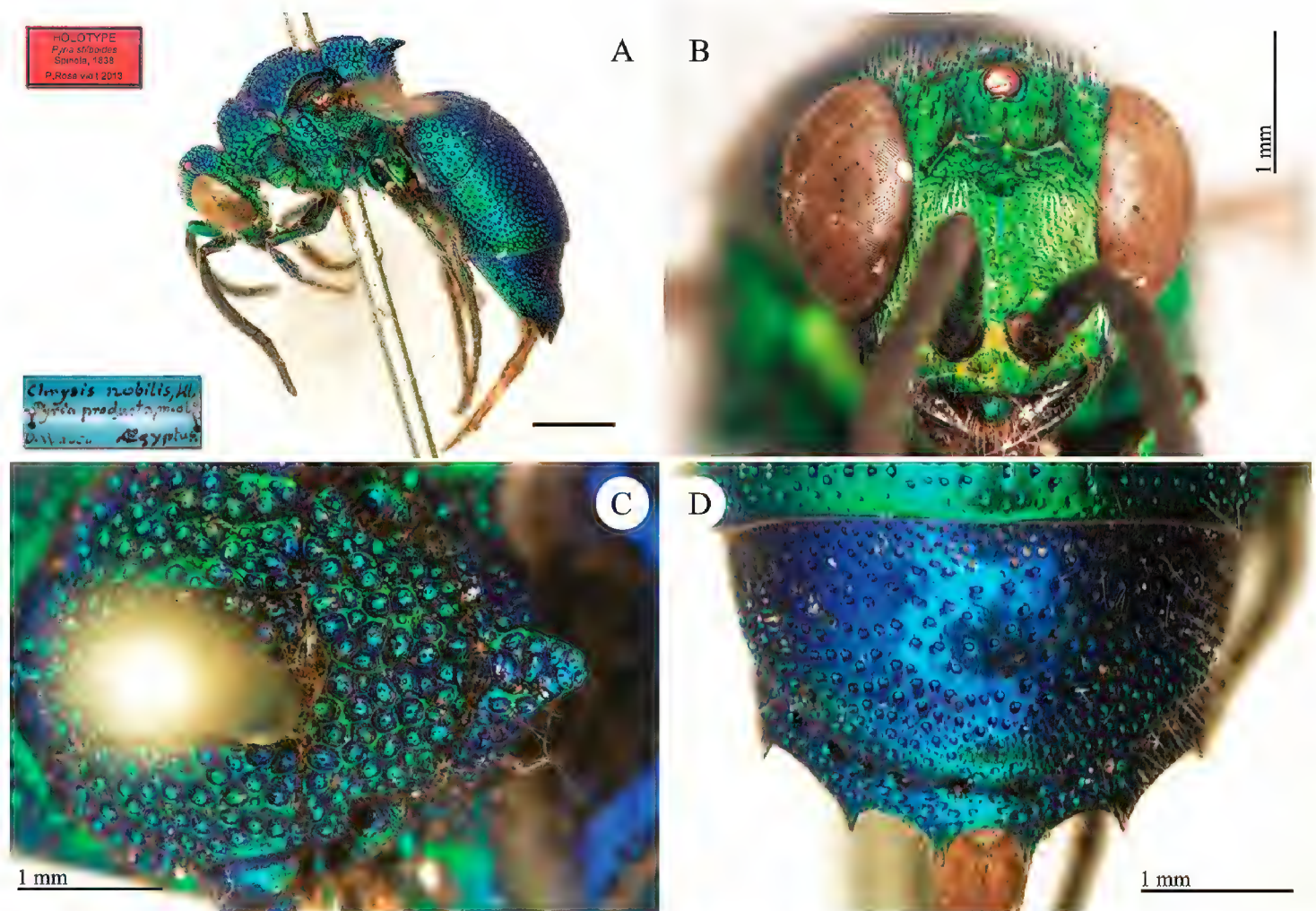
Plate 46

*Pyria stilboides*: Spinola 1838: 446.**Type locality.** Egypt.**Material. Holotype** ♀. *Chrysis nobilis*, Kl. *Pyria producta*, m. ol.[im] D. Walzl, Egyptus.**Catalogue Casolari & Casolari Moreno.** *Chrysis nobilis*, 132, 23, 0, 2 (box 51).**Remarks.** Spinola (1838) described *P. stilboides* based on one female. There are two specimens of this species in the Spinola collection; one female, perfectly conserved, which we consider the holotype, and a second specimen, badly damaged, which we exclude from the type series. The names written on the label (and in Casolari & Casolari Moreno) refer to Dahlbom's monograph (1854: 347), in which *P. stilboides* is considered a synonym of *C. nobilis*. The second specimen, according to Spinola's label and Dahlbom's work, was named *C. producta*.**Current status.** *Chrysis stilboides* (Spinola, 1838) (transferred by du Buysson (in André) 1896: 649).***Spinolia magnifica* Dahlbom, 1854**

Plate 26D

*Spinolia magnifica*: Dahlbom 1854: 363 *nec* Brullé, 1846.**Type locality.** "Habitat in Turcia, ad Constantinopolim a Dom. Friwaldsky detecta, Mus. Dom. Spinola, qui unicum specimen communicavit".**Material. Holotype** ♂. *Spinolia magnifica* Dlbm. – *Chrysis varicollis*, m.[ihi] ol.[im] D. Friwaldsky, Constantinopolis.**Catalogue Casolari & Casolari Moreno.** *Spinolia magnifica*, 27, 69, 30, 1 (box 51).**Current status.** *Spinolia lamprosoma* (Förster, 1853) (synonymised by Mocsáry 1887: 16).





**Plate 46.** *Pyria stilboides* Spinola, holotype **A** Habitus, lateral view **B** head, frontal view **C** mesosoma, dorsal view **D** third metasomal tergite, dorsal view.

### Types not housed in the Spinola collection

The types of the following thirteen species were thought to be part of the Spinola collection (Dahlbom 1854; Abeille 1877; Kimsey and Bohart 1991), but could not be found there. The type of *Pyria canaliculata* is in MNHN; the type of *Euchroeus festivus* Spinola is destroyed by dermestid attack, only the pin without specimen remains.

#### *Chrysis aurifascia* Brullé, 1846

*Chrysis aurifascia*: Brullé 1846: 40.

**Remarks.** Holotype unknown. The type locality is South Africa, Cape of Good Hope (Serville coll.). According to Kimsey and Bohart (1991: 387), the holotype should be housed in the Spinola collection, but we could not find any evidence for this assumption. The type should be searched for at MNHN.

**Current status.** *Chrysis aurifascia* Brullé, 1846.

***Chrysis aurifrons* Dahlbom, 1854***Chrysis aurifrons*: Dahlbom 1854: 122.

**Remarks.** Dahlbom (1854: 122) described *C. aurifrons* based on two specimens from the MNHU (found under the name *C. aurifrons* Klug) and the Spinola collection (found under the name *C. integra* var. *chrysocephala*). The type locality is "Italia, Mus. Spinolae" and "Asia minori teste D. Loew". We could not find a syntype neither in the Spinola collection and nor at MNHU. Bohart (in Kimsey and Bohart 1991: 491) designated the lectotype based on one specimen from Italy housed in LZM. In Dahlbom's collection (LZM), there is one specimen labelled as *C. aurifrons* by Dahlbom, but it is not a syntype and it does not bear any lectotype label by Bohart.

**Current status.** *Chrysis ignifrons* Brullé, 1833 (synonymized by Mocsáry 1889: 263).

***Chrysis coronata* Spinola, 1808***Chrysis coronata*: Spinola 1808: 30.

**Remarks.** *C. coronata* was erroneously placed in synonymy with *C. viridula* Linnaeus, 1761 (Kimsey and Bohart 1991: 477). In fact, the description of *C. coronata* is clear and is incompatible with the coloration and morphology of *C. viridula*: "*Magnitudo praecedentis. Antennae nigrae. Caput viride, maculâ caeruleâ vericali. Thorax viridis. Abdomen, segmentis duobus anterioribus aureis, 3° toto viridi, margine apostico triemarginato. Corpus subtus caeruleum. Pedes concolores, tarsi pallidis. Alae fuscae*". Spinola compares *coronata* with *splendidula*: "*Noli confundere cum Chrys. Splendidula Rossi, quae differt thorace quadrifasciato, fasciis alternatim viridibus et caeruleis, segmento tertio quadrispinoso, caeruleo, spinulis productis acutis, staturâ tandem in plerisque speciminibus dimidio minore*." Based on this description, *C. coronata* could be *C. rutilans* Olivier or *C. continentalis* Linsenmaier. Since the holotype is lost, we suggest *coronata* should be considered as a **nomen dubium**. According to Mocsáry (1889: 445), *C. coronata* is the male of *C. integra* Fabricius. Till now, *C. integra* has never been found in Italy and the species description of *C. coronata* is incompatible with *C. integra*. *C. coronata* is described as shorter in its dimensions by Spinola (*Long. 3. Lin. Lat. 1. ½ Lin.*), shorter than those of *integra*, which should exceed 5 lin., using the same measurement system used by Spinola.

**Current status.** *Chrysis coronata* Spinola, 1808, nomen dubium.

***Chrysis crassimargo* Spinola, 1843***Chrysis crassimargo*: Spinola 1843: 127.

**Remarks.** Spinola (1843) did not cite the type depository of the specimen collected by Ghiliani. Abeille (1879: 65) wrote that *C. crassimargo* is the female of



*C. emarginatula*, but he did not examine the type in the Spinola collection, as he stated in other cases.

**Current status.** *Chrysis emarginatula* Spinola, 1808 (synonymized by Mocsáry 1889: 231).

### ***Chrysis distinguenda* Spinola, 1838**

*Chrysis distinguenda*: Spinola 1838: 450.

**Remarks.** The type is not present in the Spinola collection. Dahlbom (1854: 282) examined the type in the Spinola collection, when it was still there, and wrote that it is entirely blue-green: "*quae species est toto corpore cyaneo-viridis*". In Egypt, only few species are known with four anal teeth and blue-green colouration. One of them is *C. blanchardi* Lucas, 1849, described from Algeria, distributed from the Iberian Peninsula via North Africa to Palestine. It could match Spinola's description. Linsenmaier overlooked this name until his last work (1999: 211), in which he placed *C. distinguenda* in the *C. ignita* group. However, *C. distinguenda* could be a small blue species as found in various species groups (e.g., *C. cerastes*, *C. ignita*, *C. scutellaris-viridissima*, *C. pallidicornis*). Therefore, we consider *Chrysis distinguenda* as **nomen dubium**.

**Current status.** *Chrysis distinguenda* Spinola, 1838, **nomen dubium**.

### ***Chrysis fasciata* Spinola, 1806**

*Chrysis fasciata*: Spinola 1806: 14 *nec* Olivier, 1790.

**Remarks.** *C. fasciata* Spinola 1806 is a primary homonym of *C. fasciata* Olivier, 1790. The first available name for this species is *Pseudospinolia uniformis* (Dahlbom, 1854). The type depository is unknown.

**Current status.** *Pseudospinolia uniformis* (Dahlbom, 1854).

### ***Chrysis hybrida* Lepeletier, 1806**

*Chrysis hybrida*: Lepeletier 1806: 127.

**Remarks.** Abeille (1879: 85) examined one specimen in the Spinola collection that he considered as a type: "*j'ai vu à Turin, dans les cartons de Spinola un type envoyé par Lepelletier lui-même et identique avec mes exemplaires*". Unfortunately, we did not find any specimen of *C. hybrida* in the Spinola collection.

**Current status.** *Chrysura hybrida* (Lepeletier, 1806) (transferred by Kimsey and Bohart 1991: 490).

***Chrysis simplex* Dahlbom, 1854**

*Chrysis simplex*: Dahlbom 1854. Hymenoptera Europaea etc., 2: 128.

**Remarks.** Dahlbom (1854: 128) described *C. simplex* based on two specimens, one coming from MNHU, and still housed there, and a second one from the Spinola collection (*C. integra* var. *maior*). This specimen is no longer present in the Spinola collection.

**Current status.** *Chrysura simplex* (Dahlbom, 1854) (transferred by Kimsey and Bohart 1991: 496).

***Chrysis splendidula* Rossi, 1790**

*Chrysis splendidula*: Rossi 1790: 76.

**Remarks.** Abeille (1877: 6) wrote that the type of *C. splendidula* is housed in the Spinola collection. This was likely erroneous information, since the syntypes are expected to be housed in MNHU, together with other Rossi's types. And we also found no evidence for the type in the Spinola collection.

**Current status.** *Chrysis splendidula* Rossi, 1790.

***Euchroeus quadratus* var. *festivus* Dahlbom, 1854**

*Euchroeus festivus*: Dahlbom 1854: 374 (given as *Euchroeus quadratus* var. *b*).

**Type locality.** "Aegypto, Dom. Walth, Mus. Dom. Spinola".

**Type** (destroyed!): *Euchroeus quadratus*, Kl.; D. Walth, Aegyptus.

**Catalogue Casolari & Casolari Moreno.** *Euchraeus quadratus*, 132, 23, 95, 0 (box 52).

**Remarks.** The type is destroyed. Only the pin and the label are left. *Euchroeus quadratus* var. *festivus* refers to *E. purpuratus* var. *consularis* du Buysson (in André), 1896 (not mentioned in Kimsey and Bohart 1991), which is the only taxon related to *E. purpuratus* distributed in North Africa (Linsenmaier 1999: 99). *E. festivus* has priority over *E. consularis*, but it was not used after 1899, contrary to *consularis*, which is the name currently in use.

**Current status.** *Euchroeus purpuratus* ssp. *consularis* du Buysson (in André), 1896.

***Hedychrum cyaneum* Brullé, 1846**

*Hedychrum cyaneum*: Brullé 1846: 52.

**Remarks.** Holotype ♂.



**Type locality.** South Africa, Cape of Good Hope (Serville coll.) According to Kimsey and Bohart (1991: 213), the holotype should be housed in the Spinola collection, but it is not there any more. The type should also be searched for at MNHN.

**Current status.** *Hedychrum cyaneum* Brullé, 1846.

### ***Pyria canaliculata* Brullé, 1846**

*Pyria canaliculata*: Brullé 1846: 20.

**Remarks.** Holotype ♀.

**Type locality.** Semegal (Serville coll.). According to Kimsey and Bohart (1991: 393), the holotype should be housed in the Spinola collection, but the type is housed in MNHN, as reported by du Buysson (1897: 570) "Type de l'auteur, ♀" in Brullé's collection.

**Current status.** *Chrysis canaliculata* (Brullé 1846) (transferred by Mocsáry 1889: 587).

### ***Sphex ignita* Linnaeus, 1758**

*Sphex ignita*: Linnaeus 1758: 571.

**Label.** *Chrysis ignita* Lin., et Dab. ♀. ♂.; typus; passim.

**Catalogue Casolari & Casolari Moreno.** *Chrysis ignita*, 157, 0, 0, 4 (box 51).

**Remarks.** Someone placed a red rounded label, which means "type", near four specimens. None of the four specimens is a type; the true syntypes (lecto- and paralectotype) are housed in LSL. Very likely Spinola wrote "*typus*" on the label to identify the typical form of *ignita* and not a variation.

**Current status.** *Chrysis ignita* (Linnaeus, 1758) (transferred by Linnaeus 1761: 414).

### **Notes on other specimens in the Spinola collection**

The following specimens are housed in the Spinola collection and could be types of species described by Dahlbom, Klug, Lepeletier, Spinola, and Wesmael, yet it is difficult or impossible to confirm their type status.

### ***Chrysis aurichalca* Lepeletier, 1806**

*Chrysis aurichalca*: Lepeletier 1806: 127.

**Label** [♀]: *Chrysis aurichalca* Lep. 127; Europa, Provenza, *Caerulipes* Fab // 6293 (currently *Chrysura cuprea* (Rossi, 1790)).

**Catalogue Casolari & Casolari Moreno.** *Chrysis aurichalca*, 148, 177, 0, 3 (box 50).

**Remarks.** The specimen with numerical rounded label (6293) could be the holotype of *C. aurichalca* Lepeletier, which arrived in the Spinola collection with the chrysidids of Latreille. The type is not housed in MNHN (du Buysson 1899).

**Current status.** *Chrysura cuprea* (Rossi, 1790) (transferred by Kimsey and Bohart 1991: 487).

### ***Chrysis bicolor* Lepeletier, 1806**

Plate 47

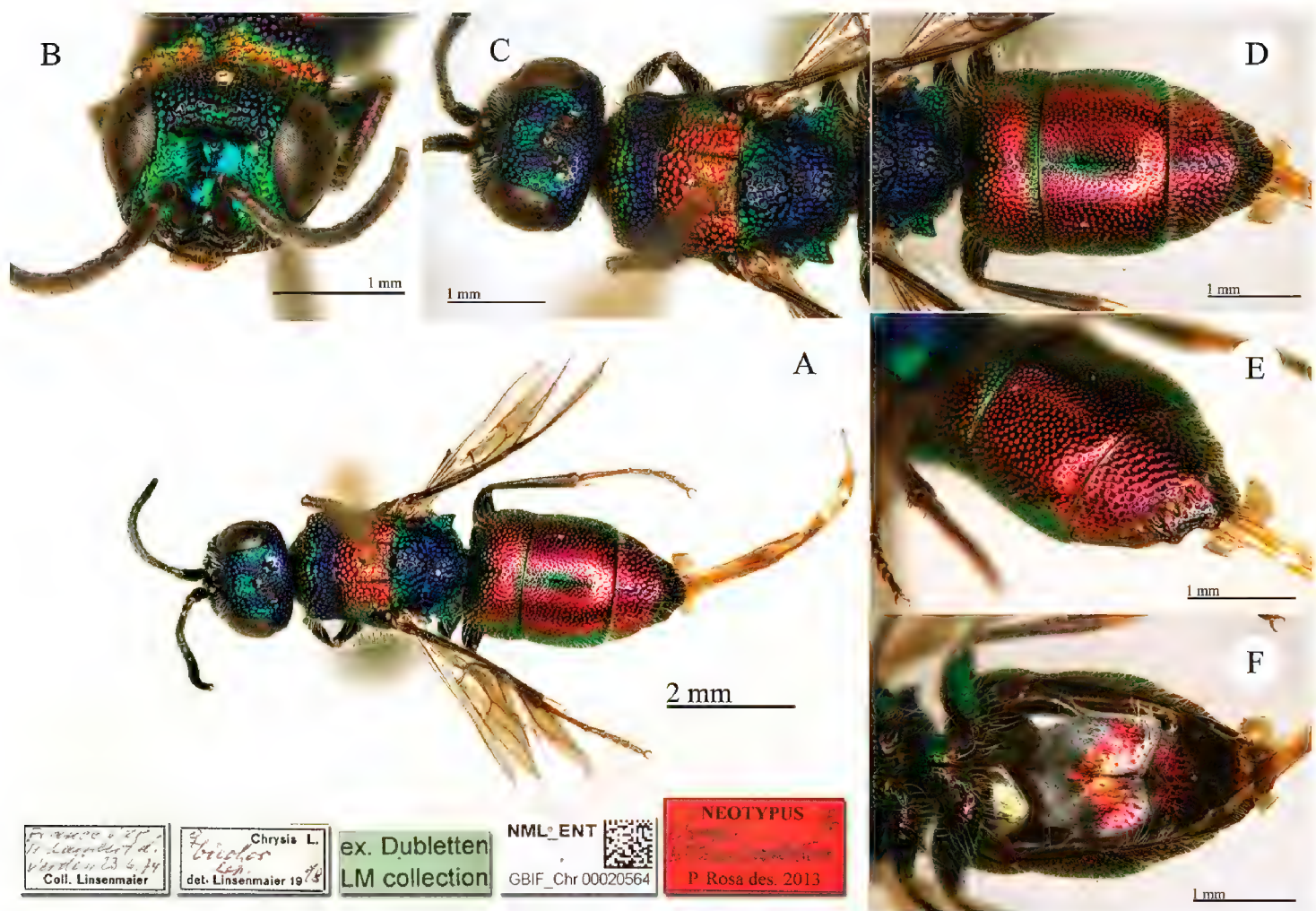
*Chrysis bicolor*: Lepeletier 1806: 127.

**Label** [♀]: *C. bicolor*, Lepel. 127; Europa P. / 6288.

**Material. Neotype** (here designated) ♀. France Var St. Laurent d. Verdon [Saint-Laurent-du-Verdon, Alpes-de-Haute-Provence department, France] 23.6.74 Coll. Linsenmaier / [leg.] Perraudin / *Chrysis* L. *bicolor* ♀ Lep. det. Linsenmaier 1998 / ex Doubletten LM collection / NML\_ENT GBIF\_Chr00020564 / **Neotypus** *Chrysis bicolor* Lepeletier, 1806 P. Rosa des. 2013.

**Remarks.** Morgan (1984: 9) designated the lectotype of *C. bicolor* in MNHN based on a male without a metasoma, writing: "*sufficient characters being present on the thorax and head to fix its identity*". According to du Buysson (1899) there are no types of *C. bicolor* Lepeletier, 1806 in the Lepeletier collection in MNHN. We were able to examine the presumed type series studied by Morgan. The specimen selected as lectotype was previously labelled as "Type" by a former curator, but it must be excluded from the type series, because Lepeletier placed the specimens under the name *Chrysis humeralis*, a species never described. The specimens identified by Lepeletier as *C. humeralis* can be found in the catalogue of du Buysson (1898: 564) in synonymy of *C. succincta* var. *bicolor*. This series of three specimens includes two different species. One specimen, bearing the name *humeralis*, is a male of *C. gribodoi* Abeille; a second specimen is a female of *C. illigeri* Wesmael and bears the label "no type status det. Morgan 1981"; the third specimen was selected by Morgan as the male lectotype of *bicolor*. According to a label pinned by Niehuis in 1998, the specimen selected by Morgan is a female and not a male. Either way, this specimen does not match the current interpretation of the species and belongs to *C. illigeri* Wesmael, 1839 (= *C. helleni* Linsenmaier, 1959 in Morgan's keys). There is no evidence to show that the selected specimen is a syntype. Lepeletier (1806) very likely described *C. bicolor* based on a single specimen ("*Mâle. Je ne sais de quell pays elle est.*"), which must be considered as a holotype by monotypy. Du Buysson (1809, 1899) did not include it in the type series. Since the specimen designated by Morgan as lectotype had been identified by Lepeletier as *C. humeralis*, and not *C. bicolor*, and as this specimens does not correspond to the description of *C. bicolor* given by Lepeletier, we do not consider it as syntype and therefore as a lectotype (Art. 74.2 of the Code).





**Plate 47.** *Chrysis bicolor* Lepeletier, neotype **A** Habitus, dorsal view **B** head, frontal view **C** head and mesosoma, dorsal view **D** metasoma, dorsal view **E** metasoma, dorso-lateral view **F** metasoma, ventral view.

Since many authors do not separate *C. bicolor* from *C. illigeri* (e.g. Kimsey and Bohart 1991: 389; Kunz 1994: 104, etc.), we think that a neotype designation of *C. bicolor* Lepeletier is needed. Moreover, the taxonomic position of the species belonging to the *C. succincta* group is not clear. For example, Kimsey and Bohart (1991) placed *C. illigeri* in synonymy of *C. bicolor* and considered *C. helleni* Linsenmaier as a valid species. But Linsenmaier himself (1997a) placed *C. helleni* in synonymy with *C. illigeri*.

We designate a **neotype** of *Chrysis bicolor* Lepeletier, 1806 using a specimen housed in the Linsenmaier collection at NMLS. It is a female and it bears the following labels: *Chrysis bicolor*: France Var St. Laurent d. Verdon [Saint-Laurent-du-Verdon, Alpes-de-Haute-Provence department, France] 23.6.74 Coll. Linsenmaier / [leg.] Perraudin / *Chrysis* L. *bicolor* ♀ Lep. det. Linsenmaier 1998 / ex Doubletten LM collection / NML\_ENT GBIF\_Ch00020564 / **Neotypus** *Chrysis bicolor* Lepeletier, 1806 P. Rosa des. 2013 (Plate 46).

The neotype matches the modern interpretation of the species according to Linsenmaier (1959: 113, figs. 350, 502, 503; 1997b: 90, fig. 66). *C. bicolor* can be separated from the similar *C. illigeri* by the different shapes of the black spots on the second sternite, the lengths of the malar space, and the shapes of the metanotum in lateral view, as well as various other characters.

**Current status.** *Chrysis bicolor* Lepeletier, 1806.

***Chrysis incerta* Dahlbom, 1854**

*Chrysis incerta*: Dahlbom 1854: 346.

**Label** [♂]: *Chrysis nobilis*, Kl.; *Pyria producta*, m. ol.; D. Walth, Egyptus.

**Catalogue Casolari & Casolari Moreno.** *Chrysis nobilis*, 132, 23, 0, 2 (box 51).

**Remarks.** Along with *C. nobilis* (= *C. stilboides*), there is a second specimen corresponding to the description of *C. incerta* Dahlbom, 1854 in the Spinolia collection. Even though it does not bear labels with locality data (the original description states: "Cajennae, Dom. *Buquet*; Mus. Dom. *Spinola*"), this specimen could be the type of *C. incerta*. Kimsey and Bohart (1991) listed syntype males presumably housed in MRSN and placed *C. incerta* as synonym of *C. stilboides* (Spinola, 1838).

**Current status.** *Chrysis stilboides* (Spinola, 1838) (synonymized by Kimsey and Bohart (1991: 466)).

***Chrysis semicincta* Lepeletier, 1806**

*Chrysis semicincta*: Lepeletier 1806: 127.

**Label** [♀]: "*Chrysis semicincta*, Lepell. / *Poecilochroa Klug* / D. Cantener Provence / D. Ghiliani, Espagne".

**Catalogue Casolari & Casolari Moreno.** *Chrysis semicincta*, 148, 177, 10, 1 (box 51).

**Remarks.** The type is not housed in the Lepeletier collection at MNHN (du Buysson 1898) and Kimsey and Bohart (1991: 461) listed it as being part of the Spinolia collection. There is only one specimen, without a label, housed in MRSN under the name *C. semicincta*. Unfortunately, there is no evidence that this is the true type of this species. Previously, at least two specimens examined by Dahlbom (1854: 242) were housed in the Spinolia collection, as written on the main label: "*Chrysis semicincta*, Lepell. / *Poecilochroa Klug* / D.[Donavit] Cantener Provence / D.[Donavit] Ghiliani, Espagne". The type locality of *C. semicincta* is unknown: "*Je ne sais de quel pays elle est*". The locality of the specimen left in the collection is unknown, too, since no locality label is pinned with the specimen. We know that part of the Lepeletier collection, and therefore some types, had been primarily bought by Cantener (Paserin d'Entrèves 1980) and later bought by Spinola (letter 00576). It is possible that Spinola bought the specimen from Cantener and wrote "Provence", the locality given by the insect dealer. We observed that the specimen had been prepared with open wings, as the one drawn on the colour plate by Lepeletier (1806). Lepeletier (1806) described *C. semicincta* from a male, but Lepeletier was often unable to identify the gender of cuckoo wasps correctly, so this could be a useless piece of information as in the case of *He. nitidum*.

**Current status.** *Chrysis semicincta* Lepeletier, 1806.



***Chrysis succincta* Linnaeus, 1767**

Plate 48A–G, I

*Chrysis succincta*: Linnaeus 1767: 947.

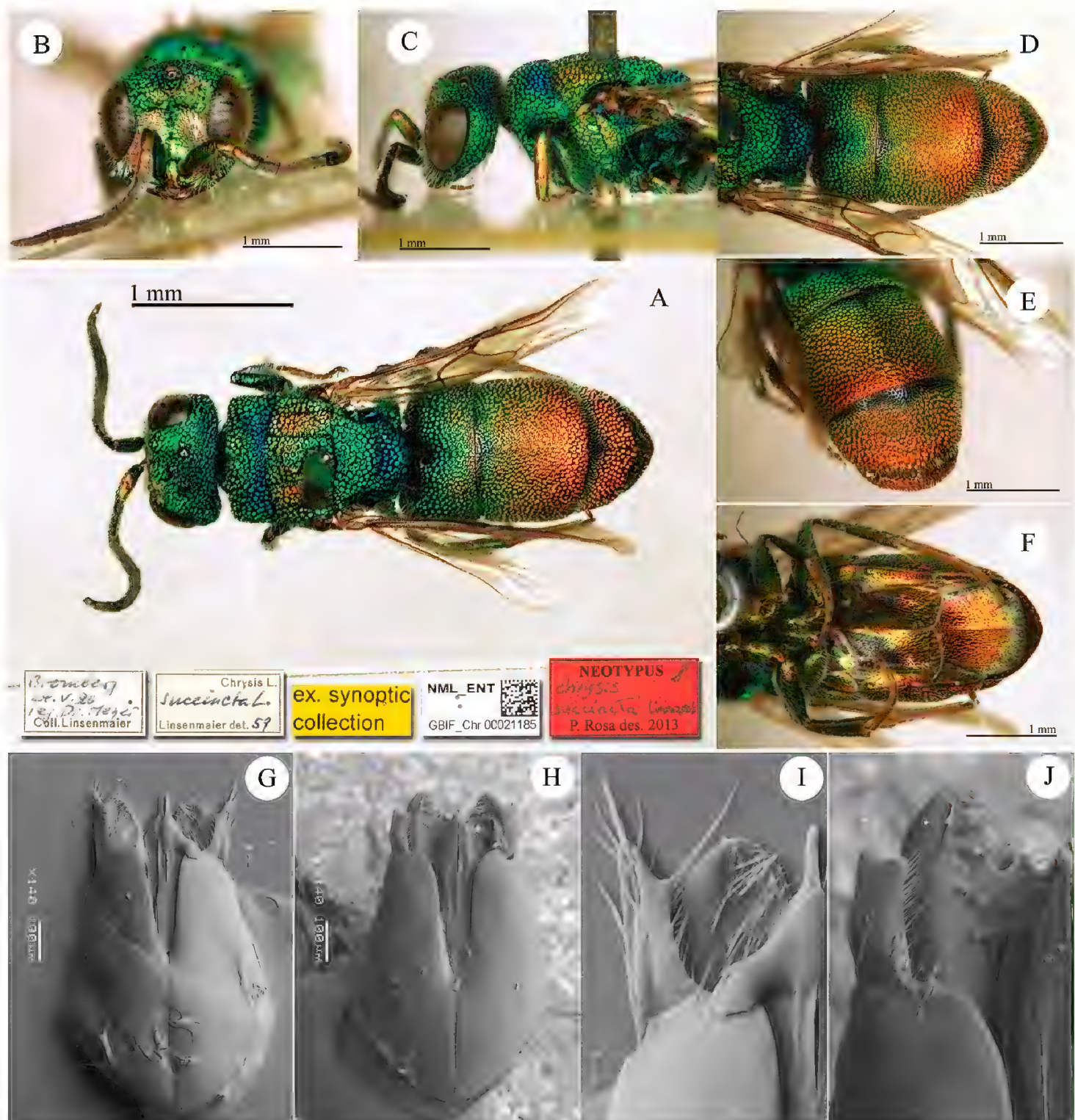
**Material. Neotype** (here designated) ♂. Bromberg [currently Bydgoszcz, Kuyavian-Pomeranian Voivodeship, Poland] 24.V.20 leg. dr. Meyer Coll. Linsenmaier / *Chrysis* L. *succincta* L. Linsenmaier det. 59 / ex synoptic collection / NML\_ENT GBIF\_Ch00021185.

**Remarks.** The description of *C. succincta* given by Linnaeus (1767) is very short, but concise and precise. Linnaeus described it with "*abdomine aureo subtridentato*". The specimen, or the specimens, examined by Linnaeus were females belonging to the species now identified as *C. illigeri* Wesmael or *C. bicolor* Lepeletier. The females of these species have four teeth on the anal margin, but the two median teeth are very close, at first sight with a low magnifying glass may appear merged into a single tooth, therefore displaying a "subtridentato" appearance.

Today, the name *C. succincta* Linnaeus is erroneously attributed to a species with the anal margin of the third tergite simple, rounded, sub-oval, and toothless. This misinterpretation has already been pointed out by Niehuis (in Mandery and Niehuis 2000: 51). *C. illigeri* and *C. bicolor* are distributed in all Europe and they are quite frequent or common in central and northern Europe, whereas *C. succincta sensu* Linsenmaier 1959 is a central European species, whose range appears to be restricted to Germany and Poland, although it is possible that its distribution went further north in Linnaeus' time. Unfortunately the type of *C. succincta* must be considered lost; it is not housed in LSL, NHRS, or LMU.

Jurine (1807: 295) was the first author to identify a specimen with a complete anal margin bearing the name *C. succincta*: "*Je n'ai pu reconnaitre ni dents, ni échancrures au dernier segment du ventre*". Later, Wesmael (1839: 176, 177) followed Jurine's interpretation. Wesmael described *C. illigeri* with: "*ano utrinque emarginato, in medio bidentato*" in contrast with his interpretation of *C. succincta*: "*ano utrinque oblique subemarginato, in medio obtuso*". After this paper, all the main authors considered *succincta* as a species with a toothless anal margin.

Linsenmaier (1959) described the *C. succincta* species group based on the misidentified *succincta*, and later Kimsey and Bohart (1991) described the *C. succincta sensu stricto* subgroup and the *C. succincta leachii* subgroup. Moreover, most of the species belonging to the *C. succincta* species group have been described as variations, forms, or subspecies of *C. succincta*, or they have been considered, sooner or later, as synonyms of *C. succincta*. For this reason, nowadays, *C. succincta* is erroneously listed as occurring in all the European countries, in northern Africa and eastwards to central Asia. The easiest way to solve the problem would be to suppress the name *C. succincta*. Since it is improper to ask for the suppression of a name given by Linnaeus, we designate a neotype based on one specimen identified as *C. succincta* by Linsenmaier, the only author who gave a detailed description of the species in the modern sense. The selected speci-



**Plate 48. A–G, I** *Chrysis succincta* Linnaeus, neotype **H, J** *Chrysis tristicula* Linsenmaier **A** Habitus, dorsal view **B** head, frontal view **C** head and mesosoma, lateral view **D** metasoma, dorsal view **E** metasoma, dorso-lateral view **F** metasoma, ventral view **G, H** genitalia **I, J** gonostyle.

men is a male housed in the Linsenmaier collection (NML), and bearing the following labels: Bromberg [currently Bydgoszcz, Kuyavian-Pomeranian Voivodeship, Poland] 24.V.20 leg. dr. Meyer Coll. Linsenmaier / *Chrysis* L. *succincta* L. Linsenmaier det. 59 / ex synoptic collection / NML\_ENT GBIF\_Ch00021185. The neotype matches Linsenmaier's description of this species (1959: 114, Figs 340, 490). The decision to designate this neotype in the Linsenmaier collection was done after consultation with other specialists (Arens, Paukkunen, Pavesi, Soon, Wiśniowski) as recommended by the Code (Recommendation 75B0. Redescription of *Chrysis succincta* Linnaeus, 1767).

**Male.** Length: 6.8 mm.



*Colour.* Head: face metallic greenish with bronze to reddish reflections on lateral sides of scapal basin, TFC, clypeus, scapus, pedicel and F-I; rest of flagellum blackish without metallic reflections; vertex greenish, area between ocelli darker with bluish to blackish intervals between the punctures; occiput greenish to bluish. Mesosoma: pronotum greenish, anterior margin with golden reflections, posterior margin bluish; mesonotum greenish to golden, not evidently in contrast with the colour of pronotum and scutellum, as in the male of *C. bicolor* Lepeletier; scutellum greenish, metanotum and propodeum greenish to bluish; mesopleuron greenish with golden reflections; femur and tibia greenish with golden reflections, more evident on tibia; tarsi testaceous. Metasoma: anteriorly greenish becoming gradually reddish posteriorly, anal margin with violet reflections; sternites and laterotergite reddish, with two large black spots on S-II.

*Head.* Scapal basin limited on the upper part by a sort of ring; it covers the entire face between the compound eyes, it is densely and finely punctuated except along the transversal median line, where the punctuation is characterized by longitudinal wrinkles. Frons with large and irregular punctures between the limit of the scapal basin and TFC; TFC not well delineated and vaguely M-shaped; punctures between TFC and mid-ocellus aligned with interspaces directed towards mid-ocellus; punctuation on ocellar area denser and with smaller punctures than on the rest of vertex. Genal carina well developed starting from the base of the mandible. Malar space 1 MOD long. Sub-antennal space 0.7 MOD. Mandible brown without subapical tooth, metallic greenish proximally. Relative lengths of P / F-I / F-II / F-III : 1 / 1.4 / 0.7 / 0.8. Short vestiture, hairs about 1 MOD long, longer under the genae.

*Mesosoma.* Pronotum with deep and large antero-median depression, ending 1 MOD before the posterior margin; punctuation double with irregular deep, dense and large punctures, without intervals, but with few small and superficial dots between the large punctures. Similar punctuation on the rest of the mesosoma, on mesonotum with deeper and larger punctures; on scutellum with large punctures on the anterior half. Propodeal tooth sharp and pointing outward; mesopleuron with scrobal and episternal sulcus evident. Long (about 1 MOD long) and erected hairs on mesosoma and legs.

*Metasoma.* T-II and T-III with double punctuation, on T-II the diameter of the larger punctures is slightly decreasing towards the posterior margin; preapical pits large and deep; apical margin of T-III simple, slightly arched, without visible teeth or cavities. Black spots on S-II large and elongated, almost in touch at their base and exceeding the middle of the sternite along the lateral margin. Hairs short (less than 1 MOD), longer at the base of T-I.

*Genital capsule* (Plate 48G, I). In dorsal view, gonocoxa with internal profile gently rounded, with short gonostyle; apex of the gonostyle simple with small subapical lobe bearing a long bristle.

**Diagnosis.** *C. succincta* mostly resemble *C. frivaldszkyi* Mocsáry and *C. tristicula* Linsenmaier (= *succinctula sensu* Linsenmaier) in respect of the shape of the anal margin, the general habitus and colour, especially of the females. It can be easily separated from the male of *C. frivaldszkyi* by the distinctively different shape of its genital cap-

sula (Rosa 2005: figs 19a, b, c) and by the different body colour; the females of *C. frivaldszkyi* and *C. tristicula* are very difficult to separate from the female of *C. succincta* based on morphological characteristics. However, their distribution in Europe is non-overlapping, with *C. succincta* being distributed in Germany, Poland, and the Baltic countries, whereas *C. frivaldszkyi* is distributed in the SE Europe, from Italy to Dalmatia, Austria, Hungary, Czech Republic, Bulgaria, Greece, Ukraine, and eastwards to Middle East. *C. tristicula* is distributed in SW Europe (Italy, Switzerland, France, Iberian Peninsula) and North Africa (Morocco, Tunisia, Egypt?). Males of *C. tristicula* can be separated based on the shape of their genital capsula when seen in dosal view: it has a different stout gonostyle, with two aligned apical lobes (Plate 48H, J). Males of *C. tristicula* also show a different colouration, having head and thorax blue with few light blue to greenish reflections, and red flame anterior drawing on pronotum, mesonotum, anterior angles of metanotum and metasoma, as in *C. illigeri* Wesmael, 1839; the shape of the black spots on the second sternite can gradually vary within the European down to the African specimens, but are always more separated (about 2 MOD) than in *succincta*.

*Chrysis semistriata* Linsenmaier is very similar to *C. tristicula*, but it seems to be restricted to Sardinia and Corsica, and it was considered as an endemic Sardinian species (Rosa 2005). It shows small chromatic and morphological differences to *C. tristicula*. It belongs to the *C. succincta* group.

**Current status.** *Chrysis succincta* Linnaeus, 1767.

### ***Chrysis westermanni* Spinola, 1838**

*Chrysis westermanni*: Spinola 1838: 454.

**Type locality.** Guinea.

**Type** (sex unknown): lost.

**Label.** *Chrysis amethystra* (sic!) Fab.; *Chr. Westermanni*, m. olim; Coll. Latr., Ind. [ie] or. [ientali] / Ind. [ie] or. [ientali].

**Catalogue Casolari & Casolari Moreno.** *Chrysis amethystra* (sic), 59, 128, 51, 3 (box 51).

**Remarks.** Three specimens are found under the main label "*Chrysis amethystra* Fab., *Chr. Westermanni*" in the Spinola collection. At least two of these specimens were examined by Dahlbom (1854: 229) and placed in synonymy of *Chrysis amethystina* Fabricius. In Kimsey and Bohart (1991: 567), *C. amethystina* is placed in synonymy of *Stilbum cyanurum* (Forster, 1771). The name *C. westermanni* Spinola is not mentioned by Kimsey and Bohart (1991). In fact, the name *C. westermanni* Spinola has been forgotten by all subsequent authors working on cuckoo wasps. Its description is hidden within the description of *Chrysis singularis* Spinola, 1838, but even if short, it is valid: "*J'ai dit aussi que plusieurs espèces du même genre avaient un bourrelet sur le troisième segment; sa présence est assez rare: on en voit des rudiments dans quelques espèces*



*exotiques, telles que les* Chr. sex-dentata, fasciata, *et dans une troisi me in dite de la Guin e, Chr. Westermanni, du nom du naturaliste qui l'a recueillie; elles font le passage   la suivante, o  le bourrelet est tr s-apparent".*

Dahlbom (1854: 232) described *C. westermanni* based on one specimen collected by Westermann in Guinea, presumably the same specimen studied some years before by Spinola. In fact, it is possible that Spinola examined Westermann's specimen and sent it back to the owner; they were in contact and exchanged material. A few years later, Dahlbom received the chrysidid collection of Westermann (Dahlbom 1854: vi) and described *C. westermanni* presumably based on the same specimen studied by Spinola. Now this type is housed in ZMUC.

The name *C. westermanni* Dahlbom, 1854 is therefore a junior homonym of *westermanni* Spinola, 1838. However, the name *C. westermanni* Spinola was never used. Therefore, to ensure the stability of the system, we will ask to the Commission on the ICZN to suppress the name *C. westermanni* Spinola.

### ***Elampus spina* Dahlbom, 1854**

*Elampus spina*: Dahlbom 1854: 41 *nec* Lepeletier, 1806.

**Label** [♀]: *Elampus spina*, Lep. - *Panzeri* var.; Coll. Latr. France / *Elampus* sp. ♀ det. L.D. French.

**Catalogue Casolari & Casolari Moreno.** *Elampus spina*, 148, 97, 51, 5 (box 50).

**Remarks.** Dahlbom (1854) described *E. spina* based on a specimen collected by Latreille and housed in the Spinola collection. Abeille (1878: 1, 2) examined one specimen which he considered as the type and he replaced the name *spina* Dahlbom with *superbus* Abeille ("*nomen   changer*"). The holotype described by Dahlbom is now housed in his collection in LZM. The female specimen housed in the Spinola collection cannot be considered as a type. *E. spina* is a secondary junior homonym of *E. spina* (Lepeletier) and a junior synonym of *E. bidens* (F rster, 1853). The synonym was already recognized by various authors: Mocs ry (1889: 73), Dalla Torre (1892: 10), etc.

**Current status.** *Elampus bidens* (F rster, 1853) (synonymised by Mocs ry 1889: 73).

### ***Elampus affinis* Wesmael, 1839**

*Elampus affinis*: Wesmael 1839: 172.

**Label** [Sex unknown]: *Elampus affinis* Wesm. / *Omalus aeneus* Dhlbm. / 3. ... Genes / 6. D. [Donavit] Wesmael, Belgique.

**Catalogue Casolari & Casolari Moreno.** *Elampus affinis*, 267, 110/39, 96, 2 (box 50).

**Remarks.** Based on Spinola's label, one specimen of this species in the Spinola collection was collected in Belgium and donated by Wesmael to Spinola. It is badly

damaged by dermestids and it lacks the metasoma and legs. However, it is possible to identify it as *Omalus aeneus* (Fabricius, 1787). Leclercq (1988: 6) listed the holotype of *E. affinis* at IRSN in Wesmael's collection. Rosa (2009: 217) found another possible syntype in Gribodo's collection in MSNG. The second specimen belongs to *Holopyga ignicollis* Dahlbom and comes from Latreille's or Serville's collection.

**Current status.** *Omalus aeneus* (Fabricius, 1787) (synonymised by Dahlbom 1854: 36).

### *Hedychrum alterum* Lepeletier, 1806

*Hedychrum alterum*: Lepeletier 1806: 122.

**Label** [♂♀]: *H. alterum*, Lepel. 122; Europa. P. / 6268 and 6269.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum alterum*, 148, 85, 0, 5 (box 50).

**Remarks.** *He. alterum* was traditionally considered as a synonym of *He. nobile* (Scopoli). No specimen labelled as *He. alterum* was found in Lepeletier's collection at MNHN (du Buysson 1898, 1899). Therefore, there is the possibility that the specimens in the Spinola collection are syntypes; the male in this collection belongs to the species *Hedychrum gerstaeckeri* Chevrier, 1869, whereas the female belongs to *Hedychrum rutilans* Dahlbom, 1854. du Buysson (1895: 18) in his "Catalogue méthodique des Chrysidides de France" listed *He. alterum* as a synonym of *He. rutilans*, without having considered the priority of the name *He. alterum* over *He. rutilans*. The short description of *He. alterum* does not allow identification of this species and part of the description is doubtful ("*Tête et corcelet verts*") because the colour of head and pronotum and mesonotum in *H. nobile* has no contrasts. Confidence in that Lepeletier described at least one specimen of *He. rutilans* comes from the colour drawing (Lepeletier 1806: pl. 6: fig. 8). In this drawing, it is clear that pronotum and mesonotum are green, contrasting with the rest of the mesosoma, which is blue. Therefore, based on the drawing and the diagnosis given by du Buysson (1899), we can assume the synonym *He. rutilans* Dahlbom, 1854 = *H. alterum* Lepeletier, 1806.

*He. alterum* was misinterpreted by Dahlbom (1854: 79), who placed it in synonymy with *He. lucidulum* (Fabricius, 1775) [currently *He. nobile* (Scopoli, 1763)] without having examined the type. He simply listed "*Hedychrum alterum* Dufour in litt.". Based on this work, all the other authors, from Dalla Torre (1892: 34) to Kimsey and Bohart (1991: 217) placed *He. alterum* in synonymy with *He. nobile*.

Since the name *He. rutilans* is currently in prevailing usage, we propose the reversal of precedence in accordance with the Art. 23.9 of the Code. In fact, the prevailing usage must be maintained when the two conditions are both met: the senior synonym has not been used as a valid name after 1899 and the junior synonym has been used for this species as a valid name in at least 25 works published by at least 10 authors in the immediately preceding 50 years and encompassing a span of not less than 10 years. The name *He. alterum* Lepeletier was placed in synonymy with *He. nobile* by Mocsáry (1889: 172) and has never been used again as a valid species name. In contrast, more



than then authors have used the name *He. rutilans* as a valid species name during the last 50 years in dozens of publications. Here are some of the most important papers from different countries: Morgan (1984: 16); Leclerq (1988: 8); Kimsey and Bohart (1991: 219); Kunz (1994: 93); Mingo (1994: 67); Strumia (1995: 3); Mandery and Niehuis (2000: 55); Niehuis (2001: 121); Rosa (2002: 106; 2005: 23; 2006: 150); Schneider (2002: 178); Burger (2003: 7); Peeters et al. (2004: 193); Drozdovskaya (2006: 101); Schljachtenok (2006: 287); Yildirim and Strumia (2006: 965); Kurzenko and Lelej (2007: 1003); Ljubomirov (2007: 530); Tyrner (2007: 47); Kroiss et al. (2008; 2009); Livory et al. (2008: 28); Szczepko and Wiśniowski (2009: 174); Orlovskiy et al. (2010: 146); Schmid-Egger (2011: 35). Since the name *He. rutilans* is in prevailing usage and both conditions requested by the code for preserving a prevailing species name are met, we consider the name *He. rutilans* as **nomen protectum** and the senior synonym *He. alterum* as **nomen oblitum**.

**Current status.** *Hedychrum alterum* Lepeletier, 1806, **nomen oblitum**.

### *Hedychrum aulicum* Spinola, 1843

*Hedychrum aulicum*: Spinola 1843: 129.

**Label** [♂]: *Hedychrum lucidulum*, v.[ar.] d. ♂. - *Hed. aulicum*, D. Crist.; D. de Cristofori. Mediolanum.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum lucidulum*, 0, 160, 19, 3 (box 50).

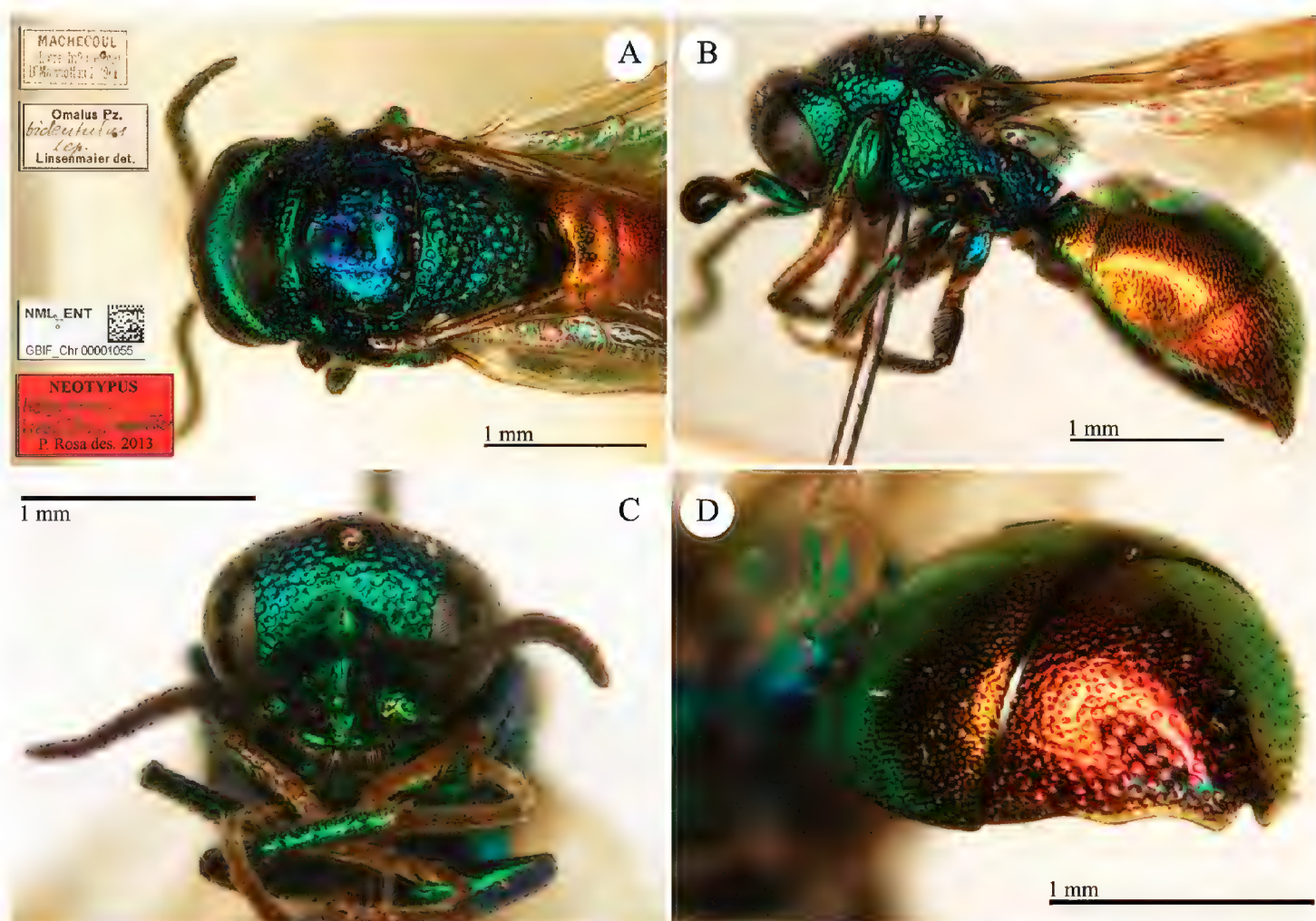
**Remarks.** Spinola (1843) described *H. aulicum* based on some males received by De Cristofori from Dalmatia, Sicily, and Spain. Dahlbom (1854: 79) examined only one male and placed it in synonymy with *He. lucidulum* (= *He. nobile*). There are still three specimens of this species in the Spinola collection: one bears a round label and it was part of Latreille's or Serville's collection; we exclude it from the type series. The second specimen belongs to *He. niemelai* Linsenmaier and we exclude it from the type series as it is a female. The third specimen is a male and could be considered as a syntype. We cannot identify the species for sure, because it is badly prepared and a new preparation might damage the specimen. The specimen likely belongs to *He. niemelai*. We suggest considering the name *He. aulicum* as **nomen oblitum** and *He. niemelai* as **nomen protectum**, since it is in prevailing usage in the last fifty years and the name *He. aulicum* has not been used after 1899.

**Current status.** *Hedychrum aulicum* Spinola, 1843, **nomen oblitum**.

### *Hedychrum bidentulum* Lepeletier, 1806

Plate 49

*Hedychrum bidentulum*: Lepeletier 1806: 121.



**Plate 49.** *Hedychrum bidentulum* Lepeletier, neotype. **A** mesosoma, dorsal view **B** habitus, lateral view **C** head, frontal view **D** second and third metasomal tergites, dorso-lateral view.

**Label** [♂]: *H. bidentulum*, Lepel. 121; Europa / *nitidus* Panz. 97.17. (currently *Philoctetes bidentulus*).

**Material. Neotype** (here designated) ♂. *Hedychrum bidentulum*: Machecoul [Loire-Atlantique department, France] (Loire-Inférieure) Dr. Marmottan 7.1901 / *Omalus* Pz. *biaccinctus* Lep. Linsenmaier det. / NML\_ENT GBIF\_Ch00001055 / **Neotypus** *Hedychrum bidentulum* Lepeletier, 1806 P. Rosa des. 2013.

**Casolari & Casolari Moreno:** *Cleptes* (sic!) *bidentulum*, 148, 85, 0, 5 (box 50).

**Remarks.** Lepeletier (1806) described *He. bidentulum* based on a male collected in the environs of Paris. There are five specimens under the name *He. bidentulum* at the MNHN: two of them belong to the species *Pseudomalus auratus* (Linnaeus, 1758) and three specimens are *Pseudomalus pusillus* (Fabricius, 1804) (Buysson 1897: 563). No specimen is labelled as "type"; other specimens found in the historical collections of Bosc and Lucas and identified as *bidentulus* or *bidentatus* belong to the species *Pseudomalus auratus* (Linnaeus); in the general collection (including du Buysson's collection) and Sichel's collection there are some specimens of *He. bidentulum*, collected in different localities. Casolari and Casolari Moreno (1980: 77) placed erroneously *bidentulum* in the genus *Cleptes*. The original label is: "*H. [Hedychrum] bidentulum* Lepel. 121". Two of the five specimens identified as *bidentulum* were received by Latreille or Serville and bear a round and numbered label. The one bearing the number 1651 is truly a *H. bidentulum* and could be the type of *H. bidentulum*.



Kimsey and Bohart (1991: 245) placed *He. bidentulum* in synonymy with *Omalus aeneus* (Fabricius, 1787). No European author ever accepted this synonym. Strumia (1995: 4) included *He. bidentulum* in the genus *Pseudomalus*, but the correct placement is in the genus *Philoctetes* (Niehuis 2001: 121; Rosa 2003: 305; 2005: 126).

Since the holotype of *He. bidentulum* is currently lost, since this species is widely distributed in Europe and common at some localities, we designate a neotype to fix the interpretation of this species *sensu* Linsenmaier (1959). The specimen is a male housed in the Linsenmaier collection at NML and bears the following labels: *Hedychrum bidentulum*: Machecoul [Loire-Atlantique department, France] (Loire-Inférieur) Dr. Marmottan 7.1901 / *Omalus* Pz. *biaccinctus* Lep. Linsenmaier det. / NML\_ENT GBIF\_Chr00001055 / **Neotypus** *Hedychrum bidentulum* Lepeletier, 1806 P. Rosa des. 2013.

The neotype matches the interpretation of the species given by European authors and some drawings and photographs can be found, for example, in Kunz (1994: 49, figs 58, 62), Linsenmaier (1997b: 49, fig. 18), and Rosa (2006: tav III: figs 19, 21).

**Current status.** *Philoctetes bidentulus* (Lepeletier, 1806) (transferred by Niehuis 2001: 121).

### *Hedychrum cupreum* Dahlbom, 1845

*Hedychrum cupreum*: Dahlbom 1845: 3.

**Label** [♀]: *Hedychrum cupreum*; Dhlbm. ♀; D.[Donavit] Dahlbom, Scania.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum cupreum*, 27, 187, 20, 2 (box 50).

**Remarks.** In the Spinola collection, there are two specimens of *Hedychridium cupreum* (Dahlbom, 1845) given by Dahlbom. Dahlbom described this species based on female specimens collected in Sweden. It is possible that the two specimens in the Spinola collection are syntypes sent to Spinola by Dahlbom. Abeille (1879: 39) wrote "*J'ai vu à Turin [coll. Spinola], sous le nom primitif de Cupreum, deux types de cette charmante espèce venant de Danemark et envoyés par Dahlbom*". The locality of Denmark given by Abeille represents likely an error since Scania is a Swedish region. These two specimens have been already considered as possible paralectotypes in Paukkunen et al. (2014).

**Current status.** *Hedychridium cupreum* (Dahlbom, 1845) (transferred by du Buysson (in André) 1896: 746).

### 1 *Hedychrum lucidum* Lepeletier, 1806

*Hedychrum lucidum*: Lepeletier 1896: 122.

**Label** [♀]: *H. lucidum*, Lepel; 6266.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum ovatum*, 27, 9, 68, 4 (box 50).

**Remarks.** Lepeletier (1806) described *He. lucidum* based on one male and one female collected at Meudon and Soissons. There are no syntype specimens in the Lepeletier collection at MNHN (du Buysson 1899). The specimen labelled as "*H. lucidum* Lepel." and "6266" in the Spinola collection could be a syntype. It is a female specimen belonging to *Ho. jurinei* Chevrier, 1862, according to the current interpretation of the species given by Linsenmaier (1959).

**Current status.** *Holopyga lucidum* (Lepeletier, 1896) (transferred by Gogorza 1887: 38).

### ***Hedychrum nitidum* Lepeletier, 1806**

*Hedychrum nitidum*: Lepeletier 1806: 121.

**Label** [2 ♀♀]: *H. nitidum*, Lepel. 121; Europa P. / 6265.

**Catalogue Casolari & Casolari Moreno.** *Hedychrum nitidum*, 148, 85, 0, 2 (box 50).

**Remarks.** Lepeletier (1806) described *He. nitidum* based on a male, but the description is obviously based on a female. The original colour drawing (pl. 6: 6) clearly shows a specimen with ovipositor tube. Moreover, the colour given in the description likely refers to a female. In the Spinola collection there are two females, possibly syntypes. At MNHN, there are other specimens of this species coming from Lepeletier's collection, included some syntypes (du Buysson 1898: 563, as a synonym of *Ho. fervida*, currently in box 11 of the general collection).

**Current status.** *Ho. fervida* (Fabricius, 1781) (synonymized by Mocsáry 1889: 131).

### ***Hedychrum spina* Lepeletier, 1806**

*Hedychrum spina*: Lepeletier 1806: 121.

**Label** [♀]: *Elampus spina* Lep. - *Panzeri* var.; Coll. Latr. France / 6262.

**Catalogue Casolari & Casolari Moreno.** *Elampus panzeri*, 148, 97, 51, 5 (box 50).

**Remarks.** The type of *Elampus spina* (Lepeletier) could be housed at MNHN or in the Spinola collection. A specimen of this species at MNHN is labelled: *E. Panzeri* F. <handwritten by Lepeletier> / *Hedychrum spina* Lep. type? <handwritten by du Buysson> / Museum Paris Meudon (S. et. O.) Coll. Le Peletier 160-45 <partially printed, locality handwritten by du Buysson>. This specimen was not considered as a type by du Buysson (1898: 563; 1899: 160), because when arrived at MNHN it was labelled only as *E. panzeri* by Lepeletier, without locality or identification label. It perfectly matches the original description by Lepeletier and the colour drawing furnished by the author. We would nowadays identify this specimen as *Elampus constrictus* (Förster, 1853) (*sensu* Móczár 1964a). The specimen in the Spinola collection could alternatively represent the type, but even in this case, there is no certainty. It



perfectly matches Lepeletier's description and it belongs to the species *Elampus constrictus* (Förster, 1853) also.

Lepeletier's description is clear: "*Tête et corcelet d'un vert bleuâtre; yeux et antennes noirs. Corcelet très-prolongé sous l'écusson. Abdomen doré, troisième segment échancré. Pieds d'un vert bleuâtre; tarsi pâles. Ailes à peine enfumée. Mâle. De Meudon*". The description is completed by a colour drawing (pl. 6: 2) which shows a specimen with light green head and mesosoma, golden metasoma and small dimensions, being smaller than *He. nitidum* [= *Ho. fervida*] and *He. lucidum* [= *Ho. lucida*], and approximately as long as *He. roseum* [= *Hedychridium roseum*]. Description, colouration, and dimensions are different from the species considered *E. spina sensu* Linsenmaier (1959) and Móczár (1964b). This species is one of the largest *Elampus* species (up to 9 mm) in Europe, with head and mesosoma dark blue to violet and with a flame red metasoma, sometimes dark red to red-violet on the lateral sides. Even the type locality of *E. spina* seems to be out from the current distributional limits of *E. spina sensu* auctorum.

The misinterpretation of the species that the name *E. spina* refers to started with Dahlbom (1845: 41): Spinola sent a specimen to Dahlbom identified as *Elampus spina* (or *E. panzeri* var. *spina*), which he had received from Latreille, and that clearly differs from the specimen now placed in the Spinola collection under the name *spina* Lep. coll. Latreille.

Dahlbom (1854: 42) did not describe *E. spina* Lepeletier, but instead he described a new species received by Spinola and named *E. spina* Spinola: "*Habitat in Gallia, a D. Latreille detectus, e cujus Collectione Illustr. Spinola accepit individuum quod describendi causa mihi benevole misit*". Dahlbom's description matches the description of *E. bidens* (Förster, 1853): "*Submagnus 2 1/4 lin. decimal. long. violascenti et purpurascenti-aeneus abdomine cyaneo-viridi, segmento 3:tio ante emarginatnram utrinque bisinuato postscutello mucronato*".

Abeille (1878: 1, 2) replaced the name *E. spina* Dahlbom with *superbus* ("*nomen à changer*"). Both *E. spina* Dahlbom and *E. superbus* Abeille are synonyms of *E. bidens*.

Based on the type material examined in MNHN, HNHM, and LZM, the original description and drawing, *E. spina* (Lepeletier) (*sensu* Linsenmaier 1959 and Móczár 1964a) is *E. frivaldszkyi* (Förster, 1853) (= *E. productus* Dahlbom, 1854); *E. constrictus* (Förster, 1853) is the junior synonym of *E. spina* (Lepeletier, 1806). We suggest the neotype designation of *El. spina* and a revision of the European species, based on recent findings.

Moreover, we note that *E. panzeri* (Fabricius, 1804) is the valid name for *E. scutellaris* (Panzer, 1798). A future revision of the European species belonging to the genus *Elampus* is already planned to put in order the complex taxonomical problems of this genus.

Since 1845 the name *spina* has been considered as a noun and not as an adjective; in fact it was used as an invariable name in the genus *Elampus*, *Ellampus*, *Omalus*, and *Noctozus* in more than fifty publications. Kimsey and Bohart (1991) introduced the name *Elampus spinus* in accordance with the genus gender, but in conflict with the historical interpretation of the name and the articles 23.5 (applications to spellings) and 33.3.1 of the ICZN (when an incorrect subsequent spelling is in prevailing usage and is attributed to the publication of the original spelling, the subsequent spelling and attribution are to be preserved and the spelling is deemed to be the correct original spelling).

Only three authors followed the interpretation given to the name by Kimsey and Bohart (*Elampus spinus* (Tyner 2007), *Omalus (Elampus) spinus* (Arens 2014, Linsenmaier 1999)) while in other publications the name *Elampus spina* remained in use (Liubomirov 2007, Mingo 1994, Rosa 2005a, 2005b, 2006, 2009, Strumia 1995, 2005, Strumia and Yildirim 2007, 2012, Strumia, Gayubo, Gonzalez 2010, Tussac and Zumeta 2004, Vinokurov 2008).

**Current status.** *Elampus spina* (Lepeletier, 1806) (transferred by Kimsey and Bohart 1991: 171).

### ***Holopyga micans* Klug, 1835**

*Holopyga micans*: Klug 1835: 90.

**Label** [sex unknown]: *Elampus fulgidicollis*, Klug.

**Catalogue Casolari & Casolari Moreno.** *Elampus fulgidicollis*, 1, 14, 33, 3 (box 50).

**Remarks.** The specimens housed in the collection and cited by Dahlbom (1854: 55) and Abeille (1879) as types are not syntypes. Dahlbom (1854) received these specimens from Spinola under the name *fulgidicollis*, but the species was already described by Klug under the name *Holopyga micans*. Abeille (1878: 2) erroneously replaced the name *Holopyga micans* with *cicatrix* "Nom à changer, M. Lucas ayant décrit auparavant sous le nom de Micans l'H. Ovata". Later, Abeille (1879: 28) "J'ai dû changer le nome de cette espèce, M. Lucas ayant décrit, avant Dahlbom, sous le nom d'*Hedychrum micans*, l'*Holopyga gloriosa* (ovata), confondue avec l'*Hedychrum lucidulum*. "J'ai vu, dans le cartons du Musée de Turin, les types de cette charmante espèce que j'ai reçue d'Espagne (*Gogorza*)". We did not find the types of *micans* Klug at MNHU, where we found only the types of *micans* var. *viridis* Trautmann, 1926 and *micans* var. *aeneus* Trautmann, 1926. The case reported by Abeille (1879) is not a case of secondary homonym, since *He. micans* belongs to the genus *Hedychrum* and not *Holopyga*. Anyway, no author considered the two species congeneric after 1879. Kimsey and Bohart (1991: 254) used *cicatrix* as the first available name *Ho. micans* (nec *Chrysis micans* Olivier, 1790). However, Olivier did not describe any *Elampus micans*, and the two names were never considered conspecific, therefore *micans* Klug is the valid name, as already written by Mingo (1994: 208).

**Current status.** *Philoctetes micans* (Klug, 1835) (transferred by Kimsey and Bohart 1991: 254).

### ***Spintharis chrysonota* Dahlbom, 1854**

*Spintharis chrysonota*: Dahlbom 1854: 351.

**Label** [♀]: *Spintharis chrysonota*, Kl.; D. Draege, Cap. B. Esp.



**Catalogue Casolari & Casolari Moreno.** *Spintharis chrysonota*, 132, 53, 21, 3 (box 52).

**Remarks.** Kimsey and Bohart (1991: 561) examined the specimen in the Spinola collection and considered it as the holotype. But the true holotype (by monotypy) is housed in the Dahlbom collection in LZM. In the Spinola collection, under the name *chrysonota*, there are three specimens: the male of *S. destituta* Dahlbom, 1854, an undescribed species of the same genus, and the female of *S. chrysonota*, with the tip of the metasoma outside the anal margin. The differences listed by Dahlbom describing *chrysonota* and *destituta* are sexual dimorphic characteristics and the two species should be considered as male and female of the same species (Madl and Rosa 2012).

**Current status.** *Spintharosoma chrysonota* (Dahlbom, 1854) (transferred by Zimmermann 1959: 32).

### ***Spintharis destituta* Dahlbom, 1854**

*Spintharis destituta*: Dahlbom 1854: 352.

**Label** [♂]: *Spintharis chrysonota*, Kl.; D. Draege, Cap. B. Esp.

**Catalogue Casolari & Casolari Moreno.** *Spintharis chrysonota*, 132, 53, 21, 3 (box 52).

**Remarks.** As in the previous case, the specimen considered as type by Kimsey and Bohart (1991: 561) cannot be considered as a type, and the true holotype (monotypy) is housed in the Dahlbom collection in LZM. Dahlbom (1854) cited only one specimen in the description of *chrysonota* ("*qui unicum specimen communicavit*") and *destituta* ("*qui specimen communicavit*"); the specimens left in the Spinola collection cannot be considered as syntypes, even though they definitely belong to the same series of specimens received by Spinola from Draege.

**Current status.** *Spintharosoma chrysonota* (Dahlbom, 1854) (synonymized by Madl and Rosa 2012: 120).

### ***Stilbum connectens* Dahlbom, 1854**

*Stilbum splendidum* var. *connectens*: Dahlbom 1854: 358 (given as var. *b*).

**Label** [♀]: *Stilbum connectens*, m. / *calens* vel *splendidum* var. / Coll. Latr., Bengala / *splendidum* var. *b*. Dlbm.

**Catalogue Casolari & Casolari Moreno.** *Stilbum connectens*, 1, 42, 51, 1 (box 51).

**Remarks.** *S. connectens* was listed by Dahlbom as a variation, *Stilbum splendidum* var. *b*. It is not an available name and it is only a variation of *Stilbum cyanurum* (Forster).

**Current status.** *Stilbum cyanurum* (Forster, 1771).

## Conclusions

The study of the type material is fundamental in systematic entomology. For different reasons, the chrysidid types housed in some important collections (e.g. Spinola (MRSN), Radoszkowski (ISEA-PAS), Linsenmaier (NMLS)) were not available in "The Chrysidid Wasps of the World" (Kimsey and Bohart 1991). Moreover, many important European revisional and monographic works published in the 20<sup>th</sup> Century (Trautmann 1927; Berland and Bernard 1938; Balthasar 1953, 1954; Semenov-Tian-Shanskij and Nikol'skaya 1954; Linsenmaier 1959, 1968, 1997b; Moczar 1967; Semenov-Tian-Shanskij 1967; Kunz 1994; Mingo 1994) as well as few more recent ones (e.g. Tyrner 2007; van der Smissen 2010) have been published without comparative studies of the type material. Exceptions were some publications on the British fauna (Morgan 1984), on the Cleptinae (Móczár 1996, 1997a, 1997b, 1998a, 1998b, 1998c, 2000a, 2000b, 2001), a few small revisional articles (e.g. Niehuis 2000), and a regional checklist (Paukkunen et al. 2014). Most of the authors could study only the types found in their museums (e.g. Trautmann 1927 – MNHU; Berland and Bernard 1938 – MNHM; Moczar 1967 – HNHM), others (e.g. Linsenmaier) the types housed in few museums (HNHM, MNHM, NHRS, NHML). Only some authors (e.g. Móczár 1964b, 1965; Day and Fitton 1977; Day 1979; Kimsey 1988; Niehuis 2000; Rosa 2009) gave detailed diagnoses and descriptions of some chrysidid types described in the 18<sup>th</sup> and 19<sup>th</sup> centuries.

After receiving the invitation to write the volume on the Chrysididae for the series Fauna d'Italia (Baccetti and Cravedi 2009), we started a project of reviewing the types related to the European fauna. In fact, we found that many original descriptions, mostly given in Latin or French, did not match the current interpretation of the species. After a first analysis carried out on the type material housed in the most important collections (HNHM, ISEA-PAS, LZM, MHNG, MNHN, MNHU, NHMW, NHRS, NMLS, ZIN, ZMUC), we discovered that more than the 15 % of types really do not match the current interpretation of the species for the Italian fauna, and a more extensive research on the Palearctic Chrysididae was started.

In this paper, ninety-six types belonging to sixty-seven species were found in the Spinola collection, including the types of three species (*Chrysis carinata* Dahlbom, 1854; *C. exsulans* Dahlbom, 1854 and *C. succinctula* Dahlbom, 1845), whose depositories were previously unknown; the types of eight species (*Chrysis analis* Spinola, 1808; *C. bihamata* Spinola, 1838; *C. elegantula* Spinola, 1838; *C. fasciata* Spinola, 1840; *C. magnifica* Dahlbom, 1854; *C. varicornis* Spinola, 1838; *C. versicolor* Spinola, 1808; *Parnopes fischeri* Spinola, 1838) previously placed with doubt in Spinola collection; and the syntypes of eight species (*Chrysis comparata* Lepeletier, 1806; *C. dichroa* Dahlbom, 1854; *C. rutilans* Dahlbom, 1854; *Hedychrum caerulescens* Lepeletier, 1806; *He. rutilans* Dahlbom, 1854; *He. virens* Dahlbom, 1854; *Holopyga ovata* Dahlbom, 1854; *Pyria stilboides* Spinola, 1838) previously recorded only in MNHU, MNHN, or LZM. Some nomenclatural and taxonomic changes of these types are as follows: six neotypes



and twenty four lectotypes are designated; five previously designated lectotypes are set aside; two species are considered as nomina dubia, two species as nomina oblita, and another two as nomina protecta; three new synonymies are proposed. The photographs of fifty-three types are given for the first time.

This article is the first of a series concerning the study of the Chrysididae types, mainly focused on the Palaearctic fauna. Reviewing the type material is not only essential to find out what is the correct name to list in a catalogue, but also to ensure long-term stability in nomenclature that helps to shift research from boring taxonomic treatments to research on the distribution, biology, and evolution of these fascinating wasps. A major revision of the European Chrysididae is already planned and has begun with the database project of Fauna Europaea (Rosa and Soon 2012).

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## References

- Abeille de Perrin E (1878) Diagnoses de Chrysidés nouvelles. Published by the author, Marseille, 6 pp.

- Abeille de Perrin E (1879) Synopsis critique et synonymique des Chrysidés de France. Annales de la Société linnéenne de Lyon 26: 1–108.
- Arens W (2001) Revision der Arten der *Chrysis dichroa*-Gruppe auf der Peloponnes mit Beschreibung dreier neuer Arten (Hymenoptera; Chrysididae). Linzer Biologische Beiträge 33(2): 1157–1193.
- Baccetti B, Cravedi P (2009) Verballi delle adunanze del 28 Febbraio 2009. Atti della Accademia Nazionale Italiana di Entomologia 57: 9–33.
- Baker DB (1999) The Faunae Ligusticae Fragmenta of Massimiliano Spinola (1805). Beiträge zur Entomologie 49(1): 141–146.
- Balthasar V (1946) Prodrömus *Chrysididarum* Rei Publicae Cechoslovakiae. Acta Entomologica Musei Nationalis Pragae 24(324): 223–260.
- Balthasar V (1953) Monographie des Chrysidides de Palestine et des pays limitrophes. Acta Entomologica Musei Nationalis Pragae (Suppl. 2) 27: 1–317.
- Balthasar V (1954) Zlatěnký – Chrysidoida. Fauna ĀSR – volume 3. Ceskoslovenská Akademie Ved., Praha, 271 pp.
- Berland L, Bernard F (1838) Hyménoptères vespiformes. III. (Cleptidae, Chrysidae, Trigonalidae). Faune de France – volume 34. Office Central de Faunistique, Fédération Française des Société des Sciences Naturelles. Le Chevalier, Paris, 145 pp.
- Bischoff H (1913) Hymenoptera. Fam. Chrysididae. Genera Insectorum. Wytsman, Bruxelles fasc. 151, 86 pp.
- Bohart RM (1962) A review of the hexadentate species of *Chrysis* of America North of Mexico (Hymenoptera, Chrysididae). Acta Hymenopterologica 1(4): 361–375.
- Bohart RM, Kimsey LS (1982) A synopsis of the Chrysididae in America North of Mexico. Memoirs of the American Entomological Institute 33: 1–266.
- Bradley JC (1957) The types of Hymenoptera described by Amédée Lepeletier, Comte de Saint-Fargeau. Annali del Museo Civico di Storia Naturale di Genova 59: 36–50.
- Brullé GA (1833) Expédition scientifique de Morée. Section des sciences physiques. Tome III. Zoologie et Botanique. 1re partie. Zoologie. Deuxième section. Des animaux articulés. FG Levrault, Paris, 400 pp. [Dating after Sherborn and Woodward 1901 and Evenhuis 1997]
- Brullé GA (1846) Des Hyménoptères. Lepeletier de Saint-Fargeau A "Histoire Naturelle des Insectes" – Tome Quatrième. Libraire Encyclopédique de Roret, Paris, 680 pp. [Chrysididae: 1–55, pl. 37]
- Buysson R du (1891–1896) Les Chrysidés. In: André E (Ed.) Species des Hyménoptères d'Europe & d'Algérie – Tome Sixième. Dubosclard, Paris, 13–758. [64 unnumbered pages + 32 pls. (1891) 1–88, (1892) 89–208, (1893) 209–272, (1894) 273–400, (1895) 401–624, (1896) 625–756 + 1–22, (1891–1896) 64 unnumbered pages + 32 pls. Dating after Derksen & Scheiding 1963]
- Buysson R du (1898) Étude des Chrysidides du Muséum de Paris. Annales de la Société Entomologique de France 66(4): 518–580.
- Buysson R du (1899) Catalogue des Insectes Hyménoptères de la famille des Chrysidides du Muséum de Paris. Bulletin du Museum National d'Histoire Naturelle 5(4): 159–169.
- Casale A (1982) Collezione Emitterologica di Massimiliano Spinola. Cataloghi II. Museo regionale di Scienze Naturali di Torino, 120 pp.



- Casolari C, Casolari MR (1980) Collezione Imenotterologica di Massimiliano Spinola – Cataloghi I. Museo regionale di Scienze Naturali di Torino, Torino, 165 pp.
- Chevrier F (1869) Description de deux Chrysides du bassin du Léman. Mitteilungen der Schweizerischen Entomologischen Gesellschaft 3: 44–48.
- Christ JL (1791) Naturgeschichte, Klassifikation und Nomenclatur der Insekten vom Bienen, Wespen und Ameisengeschlecht: als der fünften Klasse fünfte Ordnung des Linneischen Natursystems von den Insekten, Hymenoptera. Mit häutigen Flügeln. Hermannischer Buchhandlung, Frankfurt am Main, 535 pp.
- Dahlbom AG (1845) Dispositio Methodica Specierum Hymenopterorum secundum Familias Insectorum Naturales – Part II – *Chrysis* in *sensu* Linnaeano. Berlingianis, Lund, 20 pp.
- Dahlbom AG (1854) Hymenoptera Europaea praecipue Borealia, formis typicis nonnullis, specierum generumve exoticorum propter nexum systematicum associatis, per familias, genera, species et varietates disposita atque descripta ab Adrea Gustavo Dahlbom. *Chrysis* in *sensu* Linneano. Vol. II, F. Nicolai, Berlin, 412 pp.
- Dalla Torre CG (1892) Catalogus Hymenopterorum hucusque descriptorum systematicus et synonymicus. Chrysididae (Tubulifera). Tip. G. Engelmann, Lipsiae, 118 pp.
- Day MC (1979) The species of Hymenoptera described by Linnaeus in the genera *Sphex*, *Chrysis*, *Vespa*, *Apis* and *Mutilla*. Biological Journal of the Linnean Society 12: 45–84. doi: 10.1111/j.1095-8312.1979.tb00049.x
- Day MC, Fitton MG (1977) Discovery in the Linnean Collection of the type material of insects described by Forster, with notes on the Hymenoptera. Biological Journal of the Linnean Society 9: 31–43. doi: 10.1111/j.1095-8312.1977.tb00257.x
- De Geer C (1771) Memoires pour servir a l’histoire des insectes; precedes de discours sur les insectes en general. Pierre Hesselberg, Stockholm, Tomo II, Pars II.
- De Stefani T (1888) Note sulle Crisididi di Sicilia. Il Naturalista Siciliano 7: 88–95, 114–125, 139–145, 156–161, 177–182, 215–224, 273–291.
- Eversmann E (1857) Fauna Hymenopterologica Volgo-Uralensis. Bulletin de la Société Imperiale des Naturalistes de Moscou 30: 544–567.
- Fabricius JC (1775) Systema Entomologiae, sistens insectorum classes, ordines, genera, species, adiectis synonymis, locis, descriptionibus, observationibus. Officina Libraria Kortii, Flensburgi et Lipsiae, Flensburg & Leipzig, 832 pp.
- Fabricius JC (1781) Species insectorum, exhibentes eorum differentias specificas, synonyma auctorum, loca natalia, metamorphosin, adiectis observationibus, descriptionibus. Tomo I. C.E. Bohnii, Hamburgi & Kiloni, 522 pp.
- Fabricius JC (1787) Mantissa insectorum, sistens eorum species nuper detectus adiectis characteribus genericis, differentiis specificis, emendationibus, observationibus, Tomus I. CG Proft, Hafniae, 348 pp. doi: 10.5962/bhl.title.36471
- Fabricius JC (1798) Entomologia Systematica emendata et aucta, secundum classes, ordines, genera, species adiectis synonymis locis observationibus descriptionibus. Tom. II. Supplementum Entomologiae Systematicae. Hafniae, 572 pp.
- Fabricius JC (1804) Systema Piezatorum secundum ordines, genera, species, adiectis synonymis, locis, observationibus, descriptionibus. C. Reichard, Brunsvigae, 439 pp.
- Forster JR (1771) Novae species insectorum. Centuria Davies IT & White B, London, 100 pp.

- Förster A (1853) Eine Centurie neuer Hymenopteren. Beschreibungen neuer Arten aus der Familie der Chrysididen. Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande und Westfalens 10: 266–362.
- French LD (1985) *Exallopyga*, a new genus of Neotropical Elampinae. Journal of Kansas Entomological Society 58: 620–625.
- Gay C (1851) Historia física y política de Chile según documentos adquiridos en esta república durante doce años de residencia en ella y publicada bajo los auspicios del supremo gobierno. Zoologia. Claudio Gay, Paris, 572 pp.
- Generani M, Scaramozzino PL (2000) Australian Hymenoptera in the Spinola collection: a list of species. In: Austin AD, Dowton M (Eds) Hymenoptera: evolution, biodiversity and biological control. Fourth International Hymenoptera Conference (Canberra, Australia), January 1999, 231–243.
- Gestro R (1915) Ricordo de Massimiliano Spinola. Annali Museo Civico Storia Naturale Genova (Serie 3a) 7(47): 33–53.
- Giachino PM (1982) Collezione Coleotterologica di Massimiliano Spinola. Cataloghi. III. Museo regionale di Scienze Naturali di Torino, Torino, 616 pp.
- Gogorza J (1887) Crisidídeos de los alrededores de Madrid. Anales de la Real Sociedad Española de Historia Natural 16: 17–88.
- Guérin-Méneville FE (1842) Description de quelques Chrysidides nouvelles. Revue Zoologique 5(5): 144–150.
- Horn W, Schenkling S (1928–1929) Index litteraturae entomologicae. Serie: Die Welt-Literatur über die gesamte Entomologie bis inklusive 1863. 4 vols. W. Horn, Berlin-Dahlem.
- ICZN (1998) Opinion 1906. *Euchroeus* Latreille, 1809 (Insecta, Hymenoptera): conserved; *Chrysis purpurata* Fabricius, 1787 (currently *Euchroeus purpuratus*): specific name conserved; and *Chrysis gloriosa* Fabricius, 1793: specific name suppressed. Bulletin of Zoological Nomenclature 55(3): 194–196.
- ICZN (1999) International Code of Zoological Nomenclature. Fourth Edition. ITZN, London, 306 pp.
- Invrea F (1923) Note su alcune *Holopyga* (Hym. – Chrysididae). Bollettino della Società entomologica italiana 55: 13–15.
- Jurine L (1807) Nouvelle méthode de classer les Hyménoptères et les Diptères. Hyménoptères. Tomus I JJ Paschoud, Geneve, 320 pp.
- Kimsey LS (1985) Distinction of the "*Neochrysis*" Genera and description of new species (Chrysididae, Hymenoptera). Psyche 92(2–3): 269–286. doi: 10.1155/1985/64939
- Kimsey LS (1986) Designation of chrysidid lectotypes. Pan-Pacific Entomologist 62: 105–110.
- Kimsey LS (1988) The identity of three Fabrician Chrysidid species (Hymenoptera). Psyche 94(3–4): 271–274. doi: 10.1155/1987/43787
- Kimsey LS, Bohart RM (1991) The Chrysidid Wasps of the World. University Press, New York, 652 pp.
- Klug F (1845) Symbolae Physicae seu Icones et Descriptiones Insectorum quae ex Itinere per Africam borealem et Asiam occidentalem Friderici Guilelmi Hemprich et Christiani Godofredi Ehrenberg Medicinae et Chirurgiae Doctorum studio novae aut illustratae redierunt. Decas Quinta. Officina Academica, Berolini, 41 unnumbered pages, 41–50.



- Kunz PX (1994) Die Goldwespen (Chrysididae) Baden-Württembergs. Taxonomie, Bestimmung, Verbreitung, Kartierung und Ökologie. Beihefte zu den Veröffentlichungen für Naturschutz und Landschaftspflege in Baden-Württemberg 77: 1–188.
- Latreille PA (1809) Genera Crustaceorum et Insectorum secundum ordinem naturalem in familias disposita, iconibus exemplisque plurimis explicata. Tomus quartus et ultimus. Amand Koenig, Parisiis et Argentorati, 399 pp.
- Leclercq J (1988) Atlas provisoire des Insectes de Belgique (et des régions limitrophes). Hymenoptera Chrysididae. Notes faunistiques de Gembloux 15: 1–39.
- Lepeletier ALM (1806) Mémoire sur quelques espèces nouvelles d'insectes de la section des Hyménoptères appelés les Portetuyaux, et sur les caractères de cette famille et des genres qui la composent. Annales du Muséum National d'Histoire Naturelle 7: 115–129.
- Lepeletier ALM, Serville AJ (1825) Hyménoptères. In: Lepeletier de St Fargeau ALM, Audinet-Serville JG, Olivier AG (Eds) Encyclopédie Méthodique. Dictionnaire des insectes, vol. 10, 7–13, 493–495.
- Linnaeus C (1758) Systema Naturae per Regna tria Naturae, secundum Classes, Ordines, Genera, Species, cum characteribus, differentiis, synonymis, locis. Editio Decima, Refurmata, Tomus I. Laurenti Salvii, Holmiae, 824 pp.
- Linnaeus C (1761) Fauna Suecia sistens Animalia Sueciae Regni: Mammalia, Aves, Amphibia, Pisces, Insecta, Vermes. Distributa per Classes et Ordines, enera et Species, cum Differentiis, Specierum, Synonymis, Auctorum, Nominibus Incolarum, Locis natalium, Descriptionibus Insectorum. Editio Altera, Auctior. Laurentius Salvius, Stockholm, 578 pp.
- Linnaeus C (1767) Systema naturae sive regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Laurentii Salvii, Holmiae, 12<sup>th</sup> ed. v. 1 (pt 2), 533–1327.
- Linsenmaier W (1951) Die europäischen Chrysididen (Hymenoptera). Versuch einer natürlichen Ordnung mit Diagnosen. Mitteilungen der Schweizerischen Entomologischen Gesellschaft 24(1): 1–110.
- Linsenmaier W (1959) Revision der Familie Chrysididae (Hymenoptera) mit besonderer Berücksichtigung der europäischen Spezies. Mitteilungen der Schweizerischen Entomologischen Gesellschaft 32: 1–232.
- Linsenmaier W (1968) Revision der Familie Chrysididae (Hymenoptera). Zweiter Nachtrag. Mitteilungen der Schweizerischen Entomologischen Gesellschaft 41(1–4): 1–144.
- Linsenmaier W (1969) The chrysid wasps of Palestine (Hym., Chrysididae). A faunistic catalogue with descriptions of new species and forms. Israel Journal of Entomology 4: 343–376.
- Linsenmaier W (1987) Revision der Familie Chrysididae (Hymenoptera). 4. Teil. Mitteilungen der Schweizerischen Entomologischen Gesellschaft 60: 133–158.
- Linsenmaier W (1997a) Altes und Neues von den Chrysididen (Hymenoptera, Chrysididae). Entomofauna 18(19): 245–300.
- Linsenmaier W (1997b) Die Goldwespen der Schweiz. Veröffentlichungen aus dem Natur-Museum Luzern 9: 1–140.
- Linsenmaier W (1999) Die Goldwespen Nordafrikas (Hymenoptera, Chrysididae). Entomofauna Suppl. 10: 1–281.

- Lucas H (1849) Hyménoptères. Exploration scientifique de l'Algérie, pendant les années 1840, 1841, 1842, publiée par ordre du gouvernement et avec le concours d'une commission académique. Série IV: Sciences physiques-Zoologie III. (Sous-série II) Histoire naturelle des animaux articulés, par H. Lucas. Deuxième partie Insectes, Imprimerie nationale, 527 pp.
- Madl M, Rosa P (2012) A Catalogue of the Chrysididae (Hymenoptera: Chrysidoidea) of the Ethiopian Region excluding Malagasy Subregion. *Linzer Biologische Beiträge* 44(1): 5–169.
- Mandery K, Niehuis O (2000) Die Goldwespen der Sammlung T. Schneid im Naturkundemuseum Bamberg. *Bericht der Naturforschenden Gesellschaft in Bamberg* 74: 45–59.
- Mercet RG (1902) Nota sobre algunos Crisididos de Siria. *Boletín de la Sociedad Española de Historia Natural* 2: 221–223.
- Mingo E (1994) Hymenoptera Chrysididae. Fauna Iberica. Museo Nacional de Ciencias Naturales Consejo Superior de Investigaciones Científicas, Madrid, vol. 6, 256 pp.
- Mocsáry A (1879) Data characteristic ad faunam Hymenopterologicam regionis Budapestinensis. In: *Topographia medicina et physica regionis Budapestinensis*. Budapest, 1879.
- Mocsáry A (1882) Chrysididae faunae Hungaricae. Hungarian Academy of Science, Budapest, vol. 3, 94 pp.
- Mocsáry A (1887) *Studia Synonymica*. *Természetrázi Füzetek* 11(1): 12–20.
- Mocsáry A (1889) *Monographia Chrysididarum Orbis Terrarum Universi*. Hungarian Academy of Science, Budapest, 643 pp.
- Mocsáry A (1893) *Additamentum secundum ad monographiam Chrysididarum Orbis Terrarum Universi*. *Természetrázi Füzetek* 15(4): 213–237.
- Móczár L (1964a) Über die *Notozus*-Arten Ungarns (Hymenoptera, Chrysididae). *Annales Historico-Naturales Musei Nationalis Hungarici* 56: 439–447.
- Móczár L (1964b) Ergebnisse der Revision der Goldwespenfauna des Karpatenbeckens (Hymenoptera: Chrysididae). *Acta Zoologica* 10: 433–450.
- Móczár L (1965) Weitere Ergebnisse der Revision der Goldwespenfauna des Karpatenbeckens (Hymenoptera, Genus: *Chrysis*). *Acta Zoologica, Zoologische Abteilung des Ungarischen Naturwissenschaftlichen Museums* 11: 168–180.
- Móczár L (1967) Fémdarázsalkatúak-Chrysidoidea. Fauna Hungariae. Akadémiai Kiadó Budapest 86(2): 1–118.
- Móczár L (1996) New data on the subfamily Cleptinae (Hymenoptera: Chrysididae). *Acta Zoologica Academiae Scientiarum Hungaricae* 42(2): 133–144.
- Móczár L (1997a) Revision of *Cleptes* (*Leiocleptes*) species of the World (Hymenoptera: Chrysididae, Cleptinae). *Folia Entomologica Hungarica* 58: 89–100.
- Móczár L (1997b) Revision of the *Cleptes nitidulus* group of the World (Hymenoptera, Chrysididae, Cleptinae). *Entomofauna* 18(3): 25–44.
- Móczár L (1998a) Revision of the *Cleptes* (*Holocleptes*) species of the World. *Acta Zoologica* 43(4): 323–343.
- Móczár L (1998b) Revision of the Cleptinae of the World. Genus *Cleptes* subgenera and species groups. (Hymenoptera, Chrysididae). *Entomofauna* 19(31): 501–516.
- Móczár L (1998c) Supplement to the revision of *Cleptes* (*Leiocleptes*) of the world (Hymenoptera: Chrysididae, Cleptinae). *Folia Entomologica Hungarica* 59: 209–211.



- Móczár L (2000a) Revision of the *Cleptes asianus* and *townesi* groups of the World (Hymenoptera, Chrysididae, Cleptinae). *Acta Zoologica Academiae Scientiarum Hungaricae* 46(4): 319–331.
- Móczár L (2000b) World revision of the *Cleptes satoi* group (Hymenoptera: Chrysididae, Cleptinae). *Annales Historico-Naturales Musei Nationalis Hungarici* 92: 297–324.
- Móczár L (2001) World revision of the *Cleptes semiauratus* group (Hymenoptera, Chrysididae, Cleptinae). *Linzer Biologische Beiträge* 33(1): 905–931.
- Morgan D (1984) Cuckoo-Wasps Hymenoptera, Chrysididae. *Handbooks for the Identification of British insects*, Royal Entomological Society of London 6(5): 1–37.
- Niehuis O (2000) The European species of the *Chrysis ignita* group: revision of the *Chrysis angustula* aggregate (Hymenoptera, Chrysididae). *Deutsche Entomologische Zeitschrift* 47 (2): 181–201.
- Niehuis O (2001) Chrysididae. In: Dathe HH, Taeger A, Blank SM (Eds) *Verzeichnis der Hautflügel Deutschlands* (Entomofauna Germanica, 4). *Entomologische Nachrichten und Berichte* 7: 119–123.
- Olmi M (1983) I Dryinidae della collezione di Massimiliano Spinola: scoperta del materiale tipico di *Anteon jurineanum* Latreille, cambiamento di status sistematico per il genere *Prenanteon* Kieffer e descrizione di una nuova specie, *Gonatopus spinolai* (Hymenoptera, Dryinidae). *Bollettino del Museo Regionale di Scienze Naturali di Torino* 1: 77–86.
- Pagliano G (2005) I Mutillidae della collezione Spinola (Hymenoptera). *Bollettino del Museo Regionale di Scienze Naturali di Torino*, 23 (1): 267–322.
- Panzer GWF (1792–1844) *Faunae Insectorum Germaniae initia oder Deutschlands Insecten*, Nürnberg, 39–48 (1797), 49–60 (1798), 61–72 (1799), 73–79 (1800), 80–85 (1801), 97–99 (1805), 101–107 (1806–1809). [Datind after Sherborn, 1923]
- Passerin d'Entrèves P (1980) La collezione Spinola di Tassarolo. *Guide alle Mostre Temporanee Museo Regionale di Scienze Naturali*, Torino, 17 pp.
- Passerin d'Entrèves P (1983) *Faunae Ligusticae Fragmenta – Insectorum Liguria species novae di Massimiliano Spinola: note bibliografiche*. *Bollettino del Museo Regionale di Scienze Naturali* 1: 215–226.
- Paukkunen J, Rosa P, Soon V, Johansson N, Ødegaard F (2014) Faunistic review of the cuckoo wasps of Fennoscandia, Denmark and the Baltic countries (Hymenoptera: Chrysididae). *Zootaxa* 3864(1): 1–67. doi: 10.11646/zootaxa.3864.1.1
- Pavesi M, Strumia F (1997) Case 2988. *Euchroeus* Latreille, 1809 and *Chrysis purpurata* Fabricius, 1787 (currently *E. purpuratus*) (Insecta, Hymenoptera): proposed conservation of usage; and *Chrysis gloriosa* Fabricius, 1793: proposed suppression of the specific name. *Bulletin of Zoological Nomenclature* 54 (1): 26–30.
- Perraudin W (1978) Essai de monographie des Chrysidides de Corse. (Hyménoptères). *Bulletin de la Société de Sciences Naturelles de Corse* 626: 53–67.
- Radoszkowski O (1877) Chrysidiformes, Mutillidae et Sphegidae. In: Fedtshenko AP (Ed.) *Puteshestvie v Turkestan [Voyage au Turkestan d'Alexis Fedtschenko]*. Sankt-Petersburg, 87 pp. [In Russian]
- Retzius AI (1783) *Genera et species insectorum, e generosissimi auctoris scriptis extraxit, digessit, quoad portem reddidit, et terminologiam insectorum Linneanam addidit*. Sigfried Lebrecht, Lipsiae. [Ed. Regeer C]



- Richards OW (1935) Notes on the nomenclature of the Aculeate Hymenoptera, with special reference to British genera and species. Transactions of the Royal Entomological Society 83: 143–176. doi: 10.1111/j.1365-2311.1935.tb00420.x
- Rosa P (2003) Nuovi reperti di Crisidi per l'Italia, con note tassonomiche (Hymenoptera, Chrysididae). Giornale italiano di Entomologia 10: 301–313.
- Rosa P (2005) I Crisidi (Hymenoptera, Chrysididae) del Museo Civico di Storia Naturale di Milano. Natura (Milano) 94(2): 1–128.
- Rosa P (2006) I Crisidi della Valle d'Aosta. Monografie del Museo regionale di Scienze naturali, St.-Pierre, Aosta, 368 pp.
- Rosa P (2009) Catalogo dei Tipi dei Crisidi del Museo Civico di Storia Naturale "G. Doria" di Genova (Hymenoptera, Chrysididae). Annali del Museo Civico di Storia Naturale "G. Doria" 100: 209–272.
- Rosa P, Soon V (2012) Hymenoptera: Chrysididae. Fauna Europaea version 2.5. <http://www.faunaeur.org> [accessed 1 Dec. 2012]
- Rossi P (1790) Fauna etrusca sistens insecta quae in provinciis Florentina et Pisana praesertim collegit Petrus Rossius. Thomae Masi & sociorum, Liburni, 348 pp.
- Scopoli JA (1763) Entomologia Carniolica exhibens Insecta Carnioliae indigena et distributa in ordines, genera, species, varietates. Methodo Linnaeana. Typis Ioannis Thomae Trattner, Vindobonae, 420 pp.
- Semenov-Tian-Shanskij A (1967) [New species of gold wasps (Hymenoptera, Chrysididae)]. Trudy Zoologicheskogo Instituta Akademii Nauk SSSR 43: 118–184. [In Russian]
- Semenov-Tian-Shanskij A, Nikol'skaya MN (1954) [Cuckoo-wasps (Hymenoptera, Chrysididae) of Tajikistan]. Trudy Zoologicheskogo Instituta Akademii Nauk SSSR 15: 89–137. [In Russian]
- Shuckard WE (1837) Description of the genera and species of the British Chrysididae. Entomologist's Magazine 4: 156–177.
- van der Smissen (2010) Schlüssel zur Determination der Goldwespen der engeren *ignita*-gruppe (Hymenoptera Aculeata: Chrysididae- Mit detaillierten Beschreibungen und 502 Original-Abbildungen. Teil I. Bilanz aus 20 Jahren entomologischer Aktivitäten (1987–2007) (Hymenoptera Aculeata). Verhandlungen des Vereins für Naturwissenschaftliche Unterhaltung zu Hamburg 43: 1–426.
- Spinola M (1805) Faunnæ [sic] Ligusticæ fragmenta. Decas prima. Typis Petri Cajetani Api, Genuae, 21 pp. [reprinted in 1980. Sphecos 3: 11–28]
- Spinola M (1806–1808) Insectorum Liguria species novae aut rariores quas in agro Ligustico nuper detexit, descripsit et iconibus illustravit Maximilianus Spinola, adjecto catalogo specierum auctoribus jam enumeratarum, quae in eadem regione passim occurrunt. Yves Gravier, Genuae, 1–160 (1806), 1–82 (1807), 83–262 (1808). [Dating after Passerin d'Entrèves 1983]
- Spinola M (1838) Comte rendu des Hyménoptères recueillis par M. Fischer pendant son voyage en Égypte, et communiqués par M. le Docteur Walzl a Maximilien Spinola. Annales de la Société Entomologique de France 7: 437–546.
- Spinola M (1840) Hyménoptères recueillis a Cayenne en 1839 par M. Leprieur, pharmacien de la Marine Royale. Annales de la Société Entomologique de France 9: 129–204.



- Spinola M (1843) Notes sur quelques Hyménoptères peu connus, recueillis en Espagne, pendant l'année 1842, par M. Victor Ghiliani, voyageur-naturaliste. Annales de la Société Entomologique de France 1(2): 111–129.
- Spinola M (1851) Insectos. Orden 7. Himenopteros. Crisiditas. XI. In: Gay C (Ed.) Historia física y política de Chile. Zoología. Maulde, Renon, Paris, 404–413.
- Strumia F (1995) Hymenoptera Chrysididae. In: Minelli A, Ruffo S, La Posta S (Eds) Checklist delle specie della fauna italiana. Calderini (Bologna) 99: 1–10.
- Tournier H (1879) Description d'Hyménoptères nouveaux appartenant a la famille des Chrysidés. Bulletin et Annales de la Société Royale Belge 22: 87–100.
- Trautmann W (1922) Untersuchungen an einigen Goldwespenformen. Deutsche Entomologische Zeitschrift 1922: 321–322.
- Trautmann W (1927) Die Goldwespen Europas. Uschman, Weimar, 194 pp.
- Tyrner P (2007) Chrysidoidea: Chrysididae (zlatěnkovití). Acta Entomologica Musei Nationalis Pragae, supplement 11: 41–63.
- Vidano C, Arzone A (1978) Sulla collezione Spinola conservata nel Castello di Tassarolo. Atti XI Congresso Nazionale Italiano di Entomologia, Portici-Sorrento, 10–15 Maggio 1976: 253–260.
- Wesmael C (1839) Notice sur les Chrysidés de Belgique. Bulletins de l'Académie Royal des Sciences et Belles-Lettres de Bruxelles 4(1): 167–177.
- Zimmermann S (1959) Die Artengruppen der *Chrysis pallidicornis* Spin. und der *Chrysis xanthocera* Klug (Hymenoptera, Chrysididae). Deutsche Entomologische Zeitschrift 6(1–3): 8–33. doi: 10.1002/mmnd.19590060103